

Engin.
Library

APRIL 4, 1935

APR 4 - 1935

THE IRON AGE

SPECIALIZED PRODUCTION

means

PROPER SPECIFICATION

EXACTING MANUFACTURE

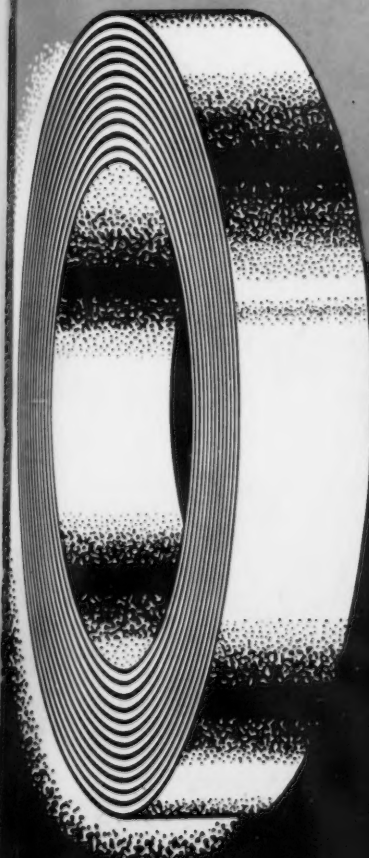
DEPENDABLE DELIVERY

THE THOMAS STEEL COMPANY • WARREN, OHIO
SPECIALIZED PRODUCERS OF COLD ROLLED STRIP STEEL

THOMASTRIP

STRIP  STEEL

BRIGHT FINISH » ZINC COATED
COPPER COATED » CADMIUM COATED



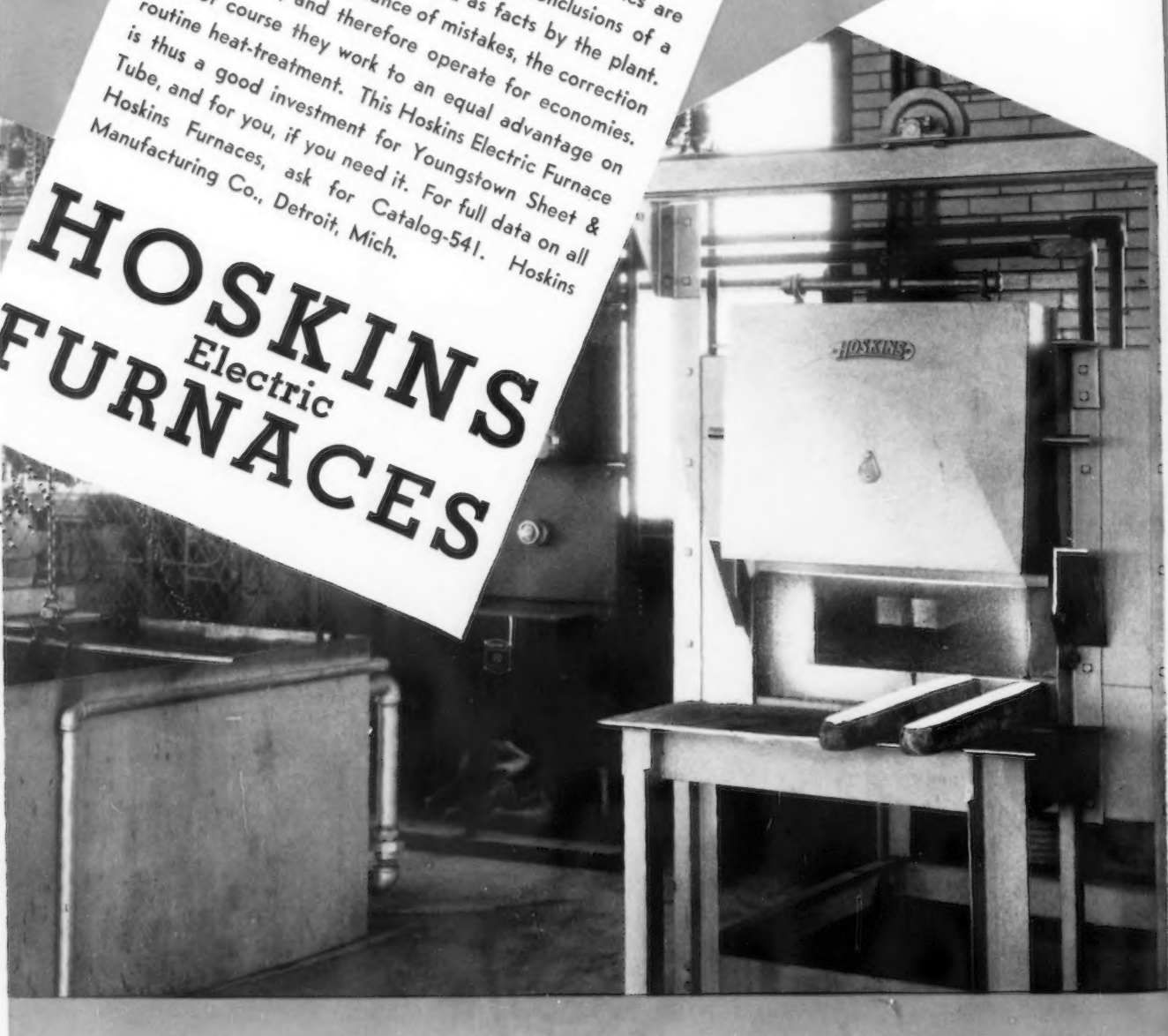
AT YOUNGSTOWN SHEET & TUBE CO.

This modern steel mill finds this Hoskins Electric Furnace useful in the metallurgical laboratory. There it is used for routine and experimental heat-treating, the latter establishing facts that serve as a guide for mill operation. Mr. John C. Herr, metallurgical engineer, says its chief advantage is the "accurately controlled and uniform heat throughout the furnace at all working temperatures." These characteristics are fundamentally necessary where the conclusions of a laboratory are to be accepted as facts by the plant. They lead to the avoidance of mistakes, the correction of difficulties, and therefore operate for economies. And of course they work to an equal advantage on routine heat-treatment. This Hoskins Electric Furnace is thus a good investment for Youngstown Sheet & Tube, and for you, if you need it. For full data on all Hoskins Furnaces, ask for Catalog-541. Hoskins Manufacturing Co., Detroit, Mich.



The Wire that Made
Electrical Heat Possible

HOSKINS Electric FURNACES



THE IRON AGE

239 West 39th St.,
New York



Owned, Published and Copyrighted
by



CHILTON COMPANY
(Incorporated)

Executive and Publication Offices,
Chestnut and 56th Sts., Philadelphia, Pa.

C. A. MUSSELMAN, President
FRITZ J. FRANK, Executive Vice-President
FREDERIC C. STEVENS, Vice-President
JOSEPH S. HILDRETH, "
GEORGE H. GRIFFITHS, "
EVERIT B. TERHUNE, "
ERNEST C. HASTINGS, "
WILLIAM A. BARBER, Treasurer
JOHN BLAIR MOFFETT, Secretary

FRITZ J. FRANK, President

J. H. VAN DEVENTER
Editor

G. L. LACHER
Managing Editor

T. H. GERKEN
News Editor

R. E. MILLER
Machinery Editor

F. J. WINTERS

T. W. LIPPERT

A. I. FINDLEY
Editor Emeritus

L. W. MOFFETT
Washington

R. A. FISKE
Chicago

F. L. PRENTISS
Cleveland

G. EHRLSTROM, JR.
Pittsburgh

BURNHAM FINNEY
Detroit

GERARD FRAZAR
Boston

R. G. MCINTOSH
Cincinnati

Contents — April 4, 1935

Foolhardiness Is Not Courage.....	13
Will Motive Power Changes Revolutionize the Railroad?	14
Widespread Observatory Construction Under Way	20
Making Chilled Car Wheels.....	22
Improved Methods in Making Model Refrigerators	27
How to Bring Out New Products.....	31
Activities Bearing on Machine Tool Distribution	32
Keeping Conveyor Trolley Wheels Lubricated	34
Malleable Iron, Its Properties and Applications	37
New Equipment.....	38
News.....	43
Personals and Obituaries.....	45
Automotive Industry.....	46
Washington News.....	49
March Pig Iron Production.....	55
Statistics on Metal-Working Activity.....	56
Markets.....	57
Construction and Equipment Buying.....	78
Products Advertised.....	126
Index to Advertisers.....	148

C. S. BAUR, General Advertising Manager
A. H. DIX, Manager, Reader Service

Member, Audit Bureau of Circulations

Member, Associated Business Papers

Published every Thursday. Subscription Price: United States and Possessions, Mexico, Cuba, \$6.00; Canada, \$8.50, including duty; Foreign \$12.00 a year. Single copy 25 Cents.

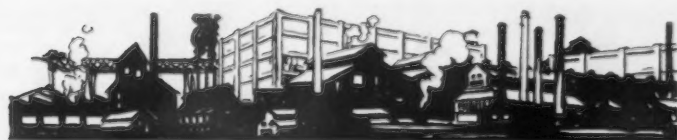
Cable Address, "Ironage, N. Y."

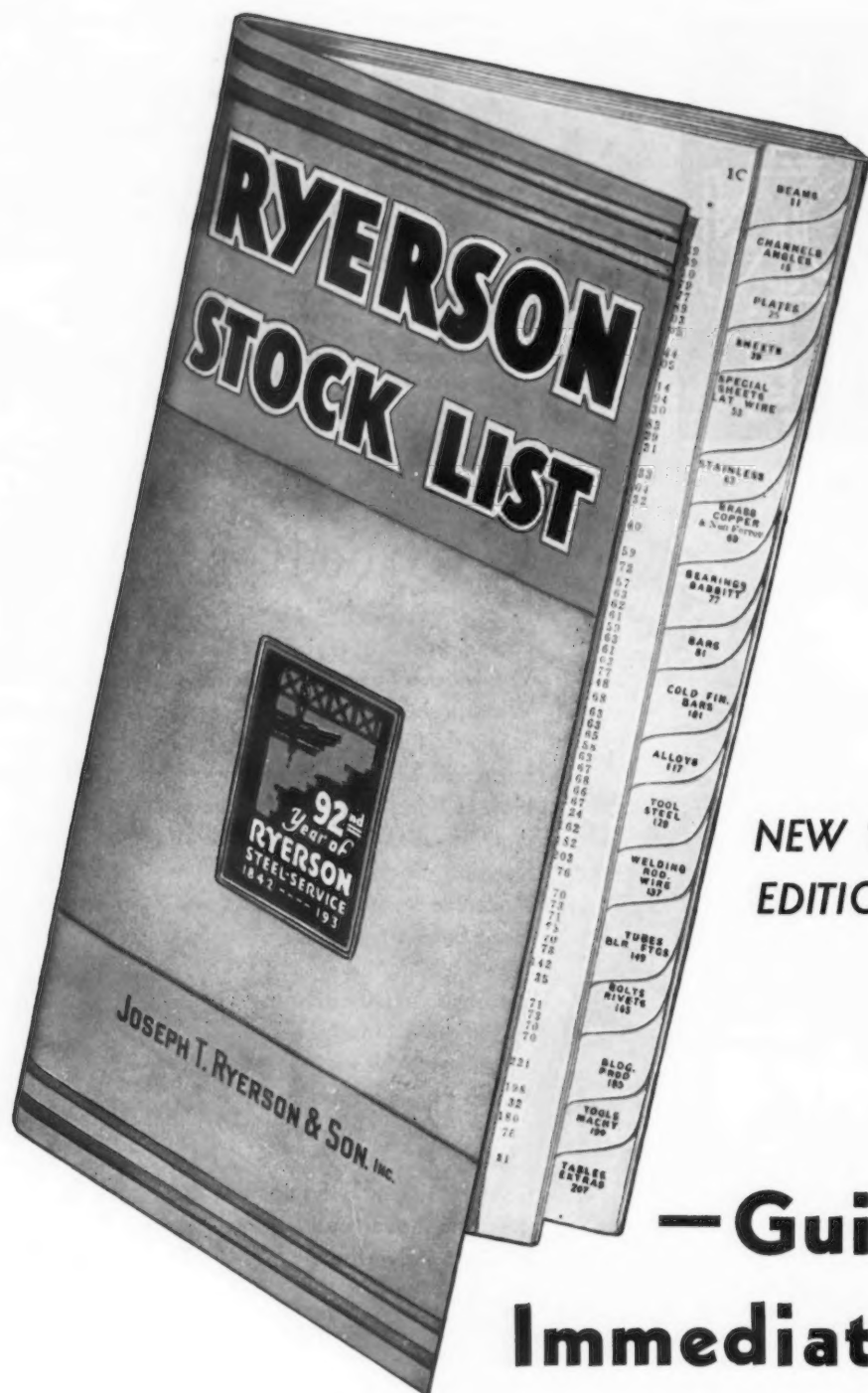
ADVERTISING STAFF

Emerson Findley, 311 Union Bldg., Cleveland
B. L. Herman, 675 Delaware Ave., Buffalo, N. Y.

H. K. Hottenstein, 802 Otis Bldg., Chicago
Peirce Lewis, 7310 Woodward Ave., Detroit
Charles Lundberg, Chilton Bldg., Chestnut & 56th Sts., Philadelphia, Pa.

C. H. Ober, 239 W. 39th St., New York
W. B. Robinson, 428 Park Bldg., Pittsburgh
W. C. Sweetser, 239 West 39th St., New York
D. C. Warren, P. O. Box 81, Hartford, Conn.





NEW 1935
EDITION—

—Guide to
Immediate Steel

Have You Received Your Copy?

For years the Ryerson Stock List has been recognized as the Key to Immediate Steel. In it you are sure to find the kind, quality and size of material you require. Copper, Brass, Babbitt and allied lines are included as well as the latest data tables such as the new S.A.E. specifications, physical properties of steels, etc. Keep it at hand and when you need steel call Ryerson for immediate shipment. *If you have not received your copy of this new edition, write and we will send it.*

JOSEPH T. RYERSON & SON, Inc., Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City.

RYERSON STEEL—SERVICE

▲▲▲ THE IRON AGE ▲▲▲

ESTABLISHED 1855

APRIL 4, 1935

Vol. 135, No. 14

Foolhardiness Is Not Courage

"BUSINESS is on a strike." "Business lacks the courage to go ahead." "Timid business men are obstructing recovery." This is the paean of pain which arises from Washington during the intervals between the dirges which damn business men for having displayed too much courage and initiative in the past.

Does business lack courage? That depends on one's interpretation of the word. Foolhardiness is not courage.

One does not demonstrate the possession of courage by stepping at night into the depths of a jungle infested by strange animals that seem anxious to eat him up. Rather, he may prove his good judgment by waiting until daylight shows him the nature of their teeth and claws, if any.

Business is now confronting a jungle filled with strange animals, the like of which have never been known before.

There is the spendapotamus, who haunts the marshes of the Potomac and whose mouth is so big that it can gobble a billion dollars at one bite.


Then there is the radiocerous, who charges through the air to gore his victims.

And there is the investigator, a scaly creature who throws mud with his tail and delights in soiling clean reputations.

Also, there is the reformostrich, a clumsy bird who runs about upsetting business men of all kinds unintentionally, and there is the pink eyed destroy-ostrich who does the same thing but with malice aforethought.

These are a few of the many strange and terrifying animals which the American business man sees, not merely in his dreams but also during his waking moments.

Courage? With all of these ominous creatures about, the American business man must have had plenty of it to venture as far as he has!



Will Changes in Motive Power

By G. W. ALCOCK

Lima Locomotive Works, Inc.

THE STEEL INDUSTRY WANTS AN ANSWER

Author's Note—The steel industry has a keen interest in railroad motive power and rolling stock; steel makers need the tonnage railroad requirements represent. Is the heavy section tonnage of the past lost forever to the steel industry? Will thin sheets be used instead of plates with a large substitution of copper and ballast for steel? This analytical study of the trend in motive power and rolling stock is offered steel makers with the hope that it will bring to the surface a critical survey of all the factors involved.



THE president of a company manufacturing Diesel motors recently stated that in his opinion the steam locomotive had outlived its usefulness. While I appreciated his confidence, and admired his optimism, I wondered on what basis his judgment had been formed.

Recent innovations have made the public railroad conscious. To what extent will these new creations influence railroad motive power and what will be their effect on the steel industry?

Railroads in common with all other industries have suffered from the post-war depression, but the railroads in addition have also suffered, and are suffering, from greatly reduced traffic due partly to conditions not directly connected with the present depression. This has resulted in a great reduction in net earnings, a matter in which the country as a whole has a material interest.

There is a feeling on the part of the general public engendered by skillful press publicity that the internal combustion motor is the panacea which will bring order out of chaos, and turn red figures into black. The dictionary defines the word panacea as "a remedy for all diseases; a cure-all."

If internal combustion engineers have found a cure-all for the ills of the railroads then they are indeed supermen, but the propaganda in favor of the internal combustion engine is naively reminiscent of Secretary of War Baker's statement to the press at the time the Liberty motor was announced, and in which he said that he had appointed a committee, locked them in a room and in 48 hr. they came out with the Liberty motor, which they all agreed was the best motor ever conceived for airplane work. The statement, unfortunately for our national reputation, was somewhat premature, and, as subsequent service tests demonstrated, decidedly inaccurate.

If the newspaper interpretation of the railroad situation is true, then the brilliant men who have devoted their lives to the development and operation of our railroads, the engineers and metallurgists who have collaborated with them in providing equipment, have all been wrong.

Relation of Present Investment to Innovations

There has been upward of 26 billion dollars invested in the railroads of the United States, a figure considered fair by the Interstate Commerce Commission. As a result of this investment the rail-

roads represent a physical plant which cannot be lightly discarded, or radically changed except on well tried out practices which have demonstrated their economic value. The permanent way is quite definitely fixed. Turntables, bridges, tunnel clearances, wheel loadings, etc., define the limits within which the designer of motive power and rolling stock must work. Grade crossings, congested areas of population, local ordinances, etc., have a marked effect on railroad operation. Speed is determined by many factors which railroad men cannot change. There are some problems which can be solved in the laboratory, and there are others which can be solved by the economist. The railroad problem, however, involving as it does many factors, the very complexity of which are liable to mislead those whose training has been in other fields, will be solved by a combination of sound engineering and sound common sense.

It is over 40 years since Dr. Rudolph Diesel first presented to the world the internal combustion motor which bears his name. In that space of time, millions of dollars have been invested in Diesel motors, and in the last 10 years it has had an extended application in different branches of transportation, both here and abroad.

There is not yet available sufficient data to properly evaluate the economic factors involved, but it is possible to draw some conclusions as to the adaptability of the Diesel motor to railroad work from a study of the service results actually obtained both here and abroad in fields most nearly analogous to American railway conditions.

Revolutionize the Railroads?

In its simplest terms, the railroad property is a plant for the manufacture of a single commodity—transportation. The price for the product is fixed by law. Except for reductions by voluntary acquiescence of the men, naturally difficult to secure, wages can be reduced only by action of the Railroad Labor Board. To reduce the cost of transportation, therefore, the railroads must depend on economies they can secure from more efficient operating equipment, and the proper type of motive power and rolling stock is a matter of paramount importance.

Many conditions enter into the selection of the design of cars and motive power. The place for the use of electricity developed in central power plants is fairly well defined. Congested areas with an intensified suburban traffic and mandatory legislation to overcome the smoke nuisance in large centers of population will largely influence future electrical installations. It is probable that high initial cost will have a deterring influence on long distance installations for many years to come.

Future of Diesel Locomotive Problematical

The place which the Diesel locomotive will make for itself is problematical. The motive power of the future will be that which best demonstrates its economy and efficiency over the length of its economic life. By the economic life is meant that number of years of service during which the total cost of operation, including the amortization of the investment, reaches its lowest yearly average. Additional years of service beyond that point would result in increased

THIS is the first of two articles dealing with one of the most challenging questions of the day. No one can gainsay that far-reaching changes in railroad equipment are getting under way, but what remains uncertain is the character and extent of those changes.

average annual cost. Certainly steam as a motive power unit cannot survive if it has outlived its economic usefulness. Whether or not the Diesel motor will displace the steam locomotive depends entirely on its ultimate ability to produce a return on the investment over the length of its economic life, due consideration being given to all the factors involved in the transition.

Results so far are not sufficiently comprehensive to justify a prediction as to the eventual place the Diesel locomotive will find in the railroad program. It involves a study of the entire railroad problem rather than an analysis of the operating costs of a few isolated installations. Unless the problem is approached from this general premise it may precipitate an alarming decline in railroad earnings. Highway and waterway competition has already made severe inroads on the traffic tonnage handled by the railroads. This traffic loss is admittedly the most serious part of the whole railroad problem. Anything which would magnify this loss would be tragic.

In analyzing the tonnage moving over the rails, it is found that in normal years coal represents practically 20 per cent of all car loadings. In other words one-fifth of all the revenue tonnage handled by the railroads is coal. Any success the Diesel power may attain must, of necessity, be directly at the expense of coal production, and must exert some influence in determining the power policy in other lines of industry, with a resultant further loss to the railroads in coal tonnage revenue.

It may be advanced that if fuel oil displaces coal to any considerable extent, the railroads will move oil in tank cars instead of coal in hopper cars. It should not be overlooked, however, that oil is moving in increasing quantities in pipe lines, and that these pipe lines compete directly with the railroads for the movement of oil tonnage. The possibilities for gain must be enormous to justify such an expense in traffic loss, and the question naturally arises as to whether or not the possibilities of steam as a prime mover have been exhausted.

Why Great Britain Adopted Oil Motors

Possibly the best answer to this is that in marine service, where the Diesel motor has had its most extended application, it is significant that the latest creation of this important branch of the transportation industry, the new Cunard-White Star ship, Queen Mary, one of the largest ships afloat, will be powered with steam, as the result of a study made by a committee of eminent British scientists.

The whole question of the application of Diesel motors is an in-

teresting one. It had its inception in Germany, but its major development in transportation was probably in Great Britain, the moving reasons being entirely apart from any thought of railroad motive power.

In the first place Diesel-engined ships were a result of Great Britain's experience in the World War. There developed a need for shortening the time of bunkering and extending the cruising range. First cost and other considerations were only incidental. In highway transportation Diesel motors of small horsepower were developed due entirely to the high tax on petrol, or gasoline as we know it. The differential between taxed petrol and untaxed fuel oil led to

of Diesel units has been reduced radically, special framing, construction and materials being utilized. To keep a ratio of car weight to power essential to the use of these Diesel units, the weight of the car has been reduced to a small percentage of that of the standard railroad steel car.

The special materials and construction possibly provide the necessary strength against longitudinal stress, but against transverse strains they have yet to receive that test of accident through which the strength of the conventional passenger car has been developed.

The Human Element and Safety

An analysis of the reports of accidents made by the Interstate

of railroad executives, metallurgists and engineers whose sole objective has been to incorporate in passenger-carrying equipment the strength necessary for the protection of human life. This work has been carried on under the close supervision of the Interstate Commerce Commission, and the public service and railroad commissions of the various States. Railroad executives, car builders and steel manufacturers have worked untiringly in the development of safer equipment, with the full knowledge that in doing so train weight increased. In the interests of the traveling public, however, it seemed as though this was the proper approach, particularly as the builders of locomotives were able to furnish

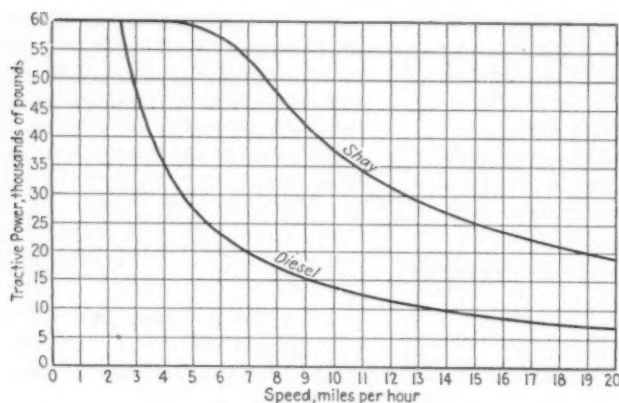


FIG. 1—Comparison of tractive power of Diesel-electric and steam locomotives at different speeds.

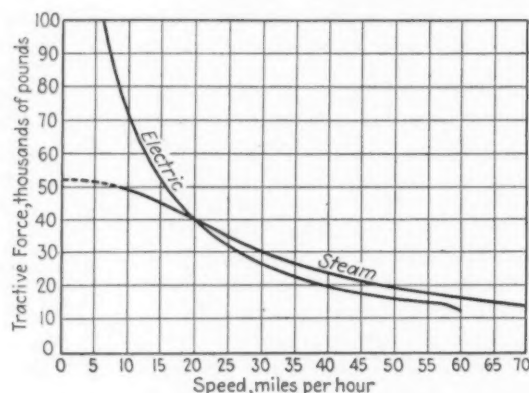


FIG. 2—Comparative tractive force curves of Canadian National 4-8-2 type steam locomotive No. 6000 and oil-electric locomotive No. 9000.

the development of Diesel motors up to about 100 hp. for highway vehicles and small rail cars. The use of these motors was gradually extended to other fields, and these basic facts were overlooked, with the result that Diesel motors have been applied, both here and abroad, in services for which this type of prime mover is not particularly well fitted.

Diesel Characteristics and Train Design

The Diesel motor with electric transmission develops its maximum tractive effort at slow train speeds, the tractive effort as the train speed increases falling off much more rapidly than is the case with a steam locomotive. This is typical of all applications of Diesel power and electric transmission. In order to compensate for this severe drop in power, the weight

Commerce Commission, in each case based on a painstaking study on the ground of all the factors involved, indicates clearly that unfortunately in many cases there was some man failure. So long as this human equation enters into rail operation, just so long must the factor of safety of passenger-carrying equipment be the subject of serious thought, and it is significant that over one-half the travelers who answered Coordinator Eastman's recent questionnaire on passenger transportation made safety a determining factor in selecting rail travel.

The transportation of passengers on the railroads of the United States has created certain standards of safety unequalled anywhere in the world. This is not just a happy accident. It is the result of involved engineering study and cooperation on the part

motive power units sufficiently powerful to handle these trains.

The New School of Thought in Relation to Safety

Now a new school of thought is developing, bringing to the railroad problem a somewhat startling philosophy. Instead of designing for safety, and then providing motive power of sufficient capacity to handle the train, their theory reverses the formula, and the limiting factor used is the capacity of the internal combustion motor, the train weight being kept within the limit the motive power unit can handle.

Whether or not this theory is tenable, time and the hazards of rail operation will tell, but the valuable experience of those whose life work has been the development of passenger equipment for railroads should not be too lightly

discarded. There are three outstanding fields in which design calculations must of necessity be based on the capacity of the power unit—the airplane, the dirigible and the submarine. In each case the designer is handicapped in that he is unable to take advantage of the accidents of the past to guide him for the future. In serious accidents in all of these branches of transportation the survivors are few, and the destruction so total as to make investigation impossible or inconclusive.

Long experience in railroad work has dictated certain standards for safety. Those who take to the air do so with the full knowledge of the frailty of the craft in which they fly, and experience has shown that they trade some element of safety for speed, even though airship designers have been most ingenious in providing the maximum strength, within the limits of weight. The traveling public, however, may not be satisfied with this airline factor of safety in rail travel; at least it is not what they have been educated to expect. The risk of fire, that horror of all railroad accidents, is also augmented in these light weight, internal combustion motor powered trains, in that in most cases an oil-burning heating boiler is located in one of the passenger-carrying cars.

New materials, new methods of construction, and advanced engineering research will undoubtedly result in lighter cars in the future, but I venture the prediction that until the designers of automotive-type equipment show that they are able to put the horse before the cart, and design motive power units to handle trains, instead of curtailing train weight to meet the limits imposed by their internal combustion motors, railroad men and the traveling public will look to steam locomotives to furnish the power to haul the trains of the future, as they have done in the past. The Federal coordinator recognizes this requirement for safety, for in his report on passenger traffic just issued he says:

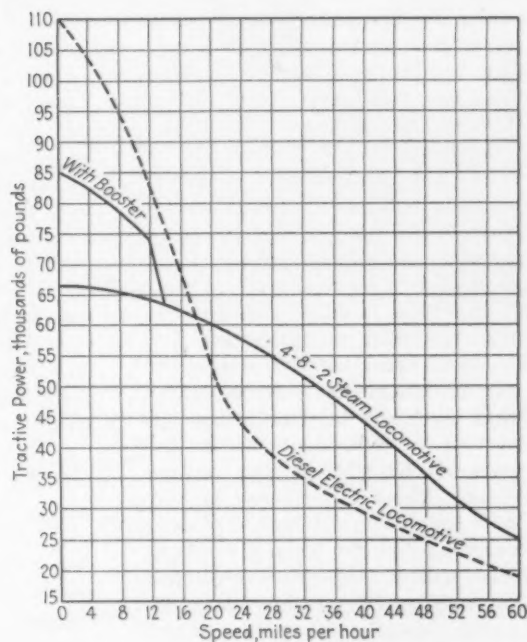
"An essential of any passenger carrier service is safety to the person of the traveler. Commendable progress has been made by the rail carriers in increasing the security of their patrons."

Branch line operation, involving as it does in many instances light and infrequent passenger travel,

and relatively small freight tonnage, offers an ideal place for the successful operation of light-weight, internal combustion powered trains, possibly operated by a single man. Units of this kind, eliminating standby losses, may convert many unprofitable branch lines into profitable ventures.

Switching service also offers a field for internal combustion locomotives, although this field may be more limited than appears at first sight. The tractive power speed curve of a typical 600-hp. Diesel electric locomotive is shown in Fig. 1. It will be seen that this gives an initial tractive effort of

FIG. 3—Tractive effort speed curve made from published figures of a proposed articulated Diesel-electric locomotive which is to develop an initial tractive effort of 110,000 lb. Similar curve for a steam locomotive developing with booster an initial tractive effort of 85,000 lb. is also shown.



60,000 lb., which is maintained to a little less than 2½ miles per hour, and at 4 miles per hour the tractive effort is only 35,000 lb.

The curve of a Shay geared steam locomotive developing an initial tractive effort of 60,000 lb. is also shown in Fig. 1. It will be seen that the drop in power as the speed increases is much less, and that at 4 miles per hour the steam locomotive develops its full tractive effort of 60,000 lb., as compared with 35,000 lb. for the Diesel electric. At 9 miles per hour the steam locomotive develops 42,000 lb. tractive effort as compared with 15,000 lb. for the oil engine. David L. Jones, instructor in the Diesel Engine Department of the United States Navy Submarine School, in his book entitled "Diesel

Engines," calls attention to this characteristic of Diesel-electric locomotives. He shows a tractive effort curve taken from actual tests of one of these locomotives in switching service, and states:

The tractive effort of the oil-electric locomotive is different from the steam locomotive in that the drop as the speed increases is more rapid. * * * With the assumption that the maximum effort available is 30 per cent of the weight of the locomotive, it is found that this is available only at .8 mile per hour or less. As the speed increases it falls off very rapidly and at a speed of 2 miles per hour it has fallen from the 30 per cent or 36,000 lb. to 21.7 per cent or 26,000 lb. At 4 miles per hour it has fallen to 18,000 lb. This is on a one

hour's rating. The fall from this point on is less rapid and at 10 miles per hour it is 8000 lb., and as the speed is still further increased it falls to 2000 lb. at 27 miles per hour.

Speed in Clearing Terminals in Relation to Diesel Locomotive

The advantage of the Diesel-electric locomotive in switching service is the maximum power it exerts at low speeds, but whether or not these speeds are so low as to mitigate against the extended use of the Diesel locomotive in switching is problematical. A study of the curves shown in Fig. 1 shows this limitation quite clearly. If the range of speed in switching service is taken as 3 to 9 miles per hour, the marked advantage of steam is evident.

It is interesting in this connec-

tion to note that as a result of intensive studies made by the Federal coordinator of transportation, Joseph B. Eastman, it is apparent that the greatest portion of transportation cost is in terminals, and that between terminals the cost of transportation by rail is low. Speed in clearing terminals is, therefore, bound to receive serious consideration in the future, and it would seem as though this inherent characteristic of the Diesel-electric locomotive might be an insurmountable handicap to its universal introduction.

The Problem of Main Line Motive Power

In main line transportation marked economies have been secured in recent years by speeding up the movement of trains. This has been particularly true of freight train movement. After all the permanent way of most of our trunk line railroads is definitely settled, and any increase in productivity must be secured by a greater utilization of existing track facilities. This means an increase in gross ton miles per hour, or net tons per mile of track per day. Railroad executives, locomotive and car designers have demonstrated that much can be done in this direction by refinements in the design of locomotives and rolling stock. These refinements in cars have been along the lines of greater carrying capacity for a given light load, and in locomotives a marked increase in boiler and cylinder efficiency, whereby the tractive power curve at speeds has been raised through a substantial increase in drawbar horsepower.

In approaching the question of main line locomotives, therefore, the Diesel-electric principle is at a disadvantage in that its power output at speed is in inverse ratio to the service requirements. The most pretentious main line Diesel-electric locomotive built in America was the articulated unit built by the Canadian National Railways, and which received very extensive service tests. This locomotive consisted of two power units coupled together and developed a tractive effort at starting of 100,000 lb., as will be seen by the curve shown in Fig. 2. It will be noted, however, that at 20 miles per hour this had dropped to 40,000 lb.

The tractive effort curve of the 4-8-2 steam locomotives of the same

road is also shown. While these locomotives developed an initial tractive effort of only 51,000 lb., the drop was so much less than the Diesel electric that the curves of the two locomotives met at 20 miles per hour, and from that point on the steam locomotive developed greater power than the oil engine. At last reports the two oil-electric units had been separated and were operating in switching or branch line service.

Fig. 3 shows a tractive effort speed curve made from the published figures of a proposed articulated Diesel-electric locomotive which is to develop an initial tractive effort of 110,000 lb.

On this chart is also shown the tractive effort speed curve of a steam locomotive developing with booster an initial tractive effort of 85,000 lb. At 18 miles per hour the two locomotives develop the same power and from that speed on the steam locomotive is much superior. The range of the speeds in which most main line work is done is probably between 30 and 50 miles per hour. In this range the characteristic drop in power of the Diesel electric is most marked, and if the tendency toward higher speed continues the superiority of steam becomes more apparent.

Speed and Steam Locomotives

Fig. 4 shows a 4-4-4 type steam locomotive built at the Mount Clare shops of the Baltimore & Ohio Railroad. This locomotive, designed by Col. George H. Emerson, chief of motive power of the railroad company, has a water tube boiler operating at a pressure of 350 lb. per square inch and has 84 in. diameter driving wheels. Although only recently placed in service, this locomotive has operated at speeds of 95 miles per hour in an entirely satisfactory manner.

The study of passenger traffic recently issued by the Federal coordinator indicates that the economies to be secured in railway operation in the future must be accompanied by a further increase in the speed of operation. Highway traffic competition makes this imperative. The improvements which have been made in the steam locomotive in the last 10 years have resulted in a marked increase in drawbar horsepower. There is every indication that much more can be done in this direction.

In the past it has been difficult to interest railroad men in innovations in the steam locomotive. There were probably sound reasons for this attitude. So long as traffic was doubling every 10 years it was possible to operate their properties at a profit, and there was no pressing necessity for experimentation with improvements which would make for economy in operation. As competition increased, however, improvements in the steam locomotive kept pace with the needs of the railroads. If further economies must be made, and they must, the steam engineering profession has shown that it can produce units capable of much greater revenue-producing possibilities.

What form these improvements will take is difficult to foretell. The skill of the metallurgist in producing better materials will have a determining effect on the ability of steam engineers to produce more horsepower for a given weight, and there is every indication that these better materials will be available as they are needed. Improvements in boiler design are also within reach of the designer. Boiler pressure has been steadily going higher, and if still higher pressures are necessary to secure greater fuel economy, water tube boilers are available providing much greater capacity for a given weight, or much less weight for a given horsepower.

New materials and new methods of construction also make it possible to greatly increase the capacity of tenders for a given light weight.

It is now possible to give railroad men frames cut from a solid rolled steel slab, which will give an elastic limit almost as high as the ultimate strength of carbon cast steel. Poppet valves and special valve gears permitting much shorter working cut-offs will give further increase in economy, and air preheaters are available with a further increase in boiler efficiency and reduction in firebox maintenance.

It has been common practice for the railroads to use old, obsolete, main line engines for branch line work and comparatively low-speed, light passenger service, the idea being to work out the potential mileage of equipment which had outlived its usefulness for the purpose for which it was originally purchased. If an intensive study

is to be made of the operating costs of branch line freight service and light passenger service, a double-end steam locomotive as illustrated in Fig. 5 would show marked economies as compared with Diesel operation. This is cited only to show the possibilities of steam for services for which the railroads

locomotives are more or less intangible, and any great increase in the number of oil engines in use might easily upset the basis on which most of the statements for economy have been based.

Even the differential in fuel cost might easily change. Coal is available in almost unlimited quantity,

The differential which has been shown in favor of the Diesel locomotive on account of the elimination of stand-by loss is also subject to shrinkage. It has been shown to be practically possible to greatly increase the utilization of steam locomotives, by a much more intensive service, thus greatly reduc-



FIG. 4—New steam locomotive which operates at 95 miles an hour.

have not in the past considered the purchase of special equipment.

Maintenance and Operating Costs

In considering maintenance and operating cost, the one factor on which much of the economy claimed for the Diesel electric locomotive is based is that of fuel cost. This is undeniably true, but to this low fuel cost must be added the increased cost for lubrication. From July, 1933, to March, 1934, inclusive, Canadian National oil-electric locomotive 9001, one-half the articulated unit, made 28,670 locomotive miles, and in this period the lubricating oil used was 4650 gal., or 6.17 miles per gallon of lubricating oil. Considering the greatly increased cost of lubricating oil as compared with fuel oil, it will be seen that this is a factor which must be taken into serious consideration.

Aside from the saving in fuel cost, the other features in favor of greater operating economy for Diesel as compared with steam

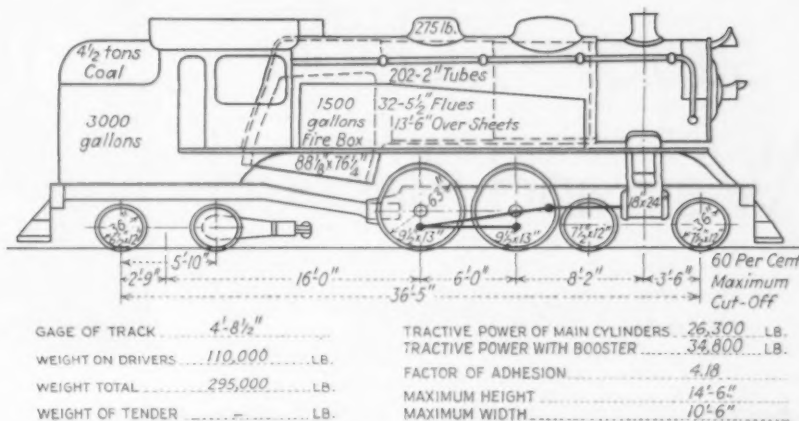


FIG. 5—Double-end type steam locomotive for branch line freight service and light passenger service. The weight on drivers is 110,000 lb. and the total weight, 295,000 lb. Tractive power on main cylinders is 26,300 lb. and tractive power with booster, 34,800 lb. Factor of adhesion is 4.18. Maximum height is 14 ft. 6 in. and maximum width 10 ft. 6 in.

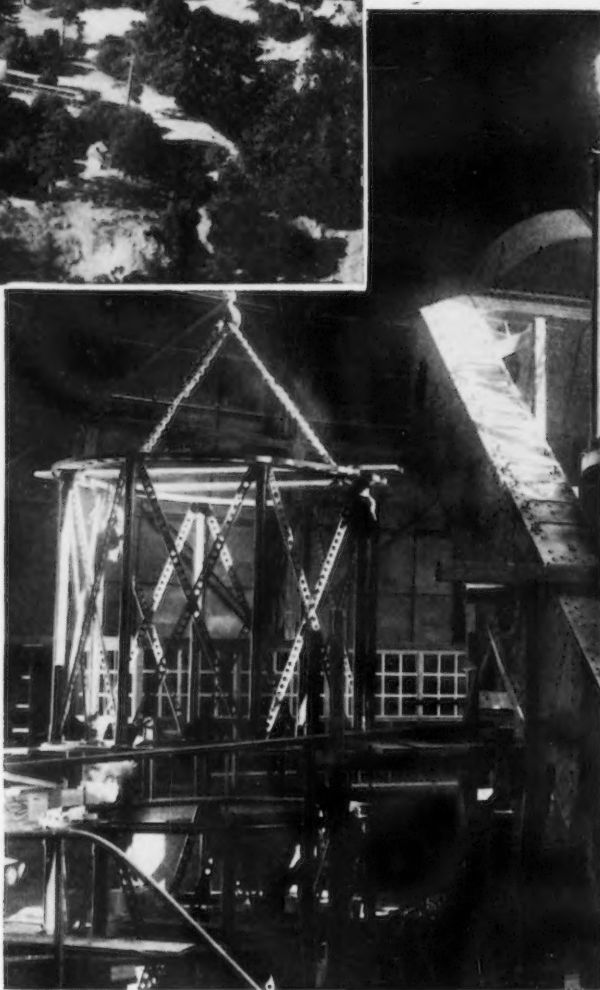
while on the other hand the supply of oil is quite limited, so much so, in fact, that the Navy has already taken steps to protect its supply as a measure of national defense. If the old law of supply and demand still obtains, the cost of fuel oil will increase with any appreciable increase in the number of Diesel units.

ing the stand-by loss. This would have the double advantage that it would work off the potential mileage of the locomotive over a shorter life, permitting its retirement at an earlier date, and insuring to the railroad a new unit which would take advantage of improvements in the state of the art. The



AT LEFT
FOUR great telescopes and their domes comprise the principal instrument equipment at Mount Wilson, Cal. The works are almost entirely structural steel and steel plate.

BELOW
THE largest telescopes, the reflector type, are



Widespread Observatory Construction Under Way and Planned

BY KHYBER FORRESTER



WITH five great planetaria now in construction or recently completed, with significant additions being made to a number of the important astronomical observatories, with a great new 200-in. telescope under construction at Mount Palomar in California, and three other great telescopes also in process of manufacture, a literal wave of interest in astronomy has swept and is sweeping this country.

Few realize, perhaps, that all of this construction planned and under way, means significant con-

sumption of iron and steel forms of many kinds, as well as a considerable draw on steel plate. Both telescope towers and the telescopes themselves are by weight five-sixths structural steel. And of the weight, the greater part is incorporated in the huge telescopes themselves.

The public has been intensively informed concerning the great 200-in. telescope now under way by the Carnegie Institution for final mounting on Mount Palomar, in California, where a huge structural steel and steel plate tower will be constructed to house it.

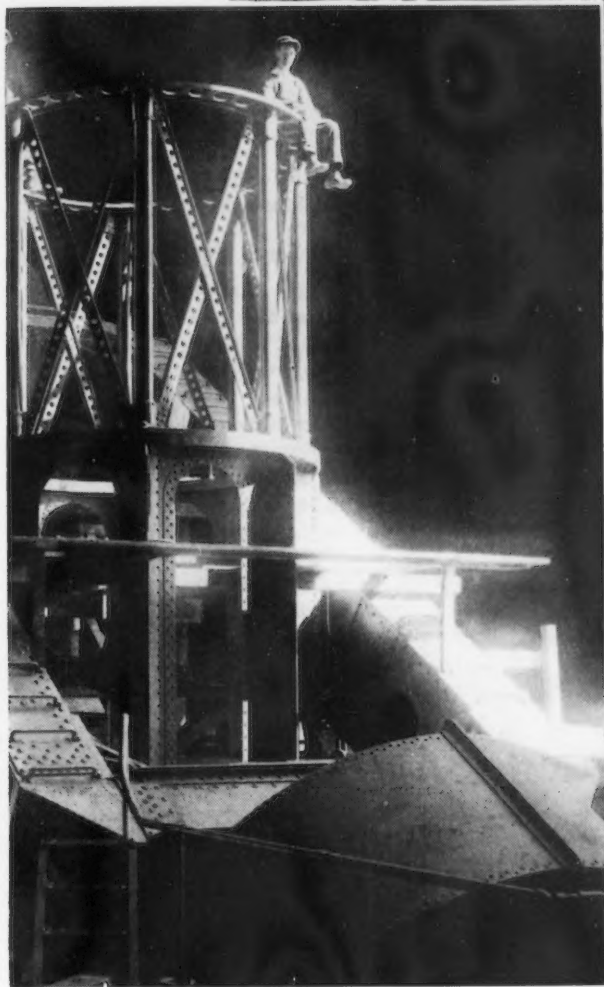
However, the 200-in. has monopolized public attention while three other great astronomical enterprises have been inaugurated, any

ASTRONOMY may soon become a practical tool of industrial research. For telescopes exploring stellar space have already brought us important information with regard to new physical properties of materials. Who,

made up principally from structural members and plates.

AT RIGHT

THE dome balcony for the Hooker telescope resembles a huge gantry crane, except that its travels are circular and not longitudinal.



one of which would just a decade or two ago have been rated as "the world's greatest." They incorporate telescopes from 84 in. to 60 in.

for example, could imagine gaseous material under such pressure as to result in a pint quantity weighing one ton?

Incidentally, the new vogue of astronomy is also creating some sizeable business for steel.

planned and under way on some enterprises, others are already brewing.

Then, too, we must not forget that the five planetaria now completing in various cities are only forerunners of many to come. Most cities of any size have some such plans in prospect.

Yet the greater consumption of iron and steel is by the large observatories and telescopes.

Apart from the large works which will go up on Mount Palomar for the 200-in. telescope, there will be those for the 84-in. telescope of Macdonald Observa-

And this is not the end. Owing to recent discoveries which promise vast industrial benefits to the earth through information concerning extremely high pressures in special objects, astronomical interest has taken on an intensive phase which may result in some of our present materials on earth assuming different physical properties of rare value to future construction. Hence, even while construction is

tory of the University of Texas, the Dunlap Observatory telescope of the University of Toronto and the University of Michigan Observatory telescope, every one of these ranking as an extensive enterprise.

The telescopes for the above are already under way, and during 1935 and 1936 mountings and housings will doubtless be drawn or construction entered upon.

Even these great astronomical functions, however, do not end the prospects, for the expectation of industrial advantages to be had from astronomical researchers already indicated by present progress is such that eminent astronomers have already stated that it may well occur that large manufacturers of national scope will soon fit out their own observatories to work on problems of intimate value to their fields.

Costs in this field of iron and steel construction are some index of the consumption of materials, almost exclusively iron and steel. The new 200-in. telescope will cost, with its housings and mountings, something more than \$2,000,000. The cost of the 100-in. installation and dome on Mt. Wilson was \$600,000 almost two decades ago. Heavy castings for the Mt. Wilson telescope (there are now three other big telescopes on the same site) were procured from the Fore River Shipbuilding Corp'n. at Quincy, Mass., and the large sections of the

(CONCLUDED ON PAGE 30)

Operations in Making Chilled

LATEST practice and equipment in the manufacture of chilled cast iron car wheels are described in this article. The production is thoroughly mechanized by conveyors and presents an interesting example of integrated foundry production.

o o o



THE newest adventure in adapting the latest practice and equipment to the manufacture of chilled-iron car wheels is the reconstruction of the Sacramento Square foundry of the Griffin Wheel Co. One of the novel features of this development is the fact that the new building, 100 ft. by 300 ft., replaced an old structure, demolition of which was started October 22, 1934, and in which wheels were cast by Feb. 26, 1935.

This Chicago foundry is where the first use was made of an air furnace for chilled wheel production*. In laying out the new plan the old cupola and air furnace room is being retained for the time being but it is soon to be rebuilt. The cupola is of the Griffin process hot-blast type and it can be used either in conjunction with or independently of the air furnace. Both the cupola and the air furnace operate on the continuous principle and troughs from both units lead to a new 15-ton receiving ladle which is motor operated and of the tilting type. In front of the ladle is a narrow gage track which

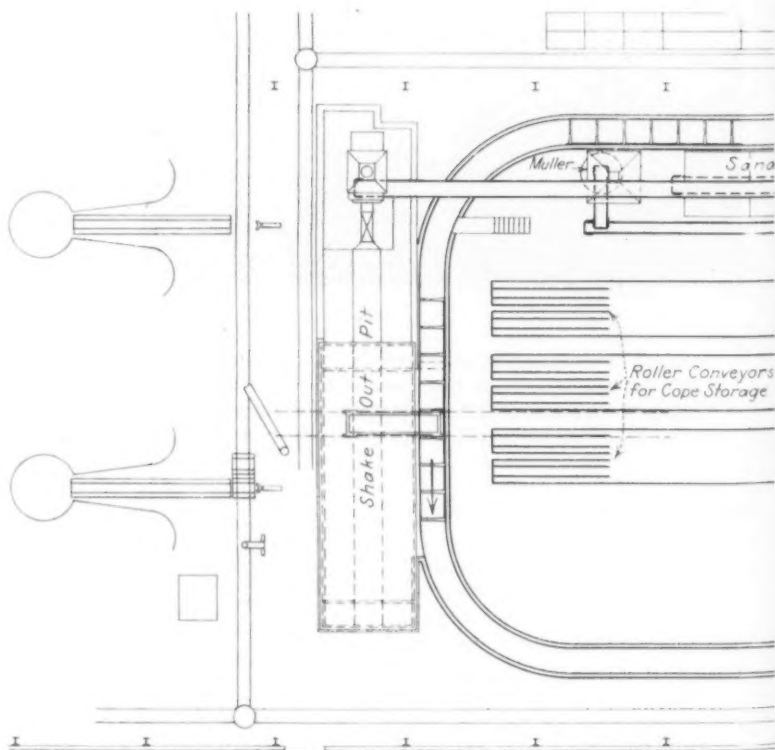
extends under a Harnischfeger Corp'n., overhead traveling crane of 10 ft. 3 in. span and on beyond to an old foundry unit which is soon to be rebuilt. Cable operated buggies travel on this track. Bottom-pour ladles of two-wheel capacity each are placed by the crane on the buggies which are spotted at the receiving ladle by an operator in a pulpit who also has at his station the electrical control for the receiving ladle motor.

When a small ladle has been filled with iron the buggy is moved under the overhead crane by which the ladle is transported to the pouring station which extends for

about 60 ft. along the north run of the mold conveyor.

Sand Handling

The sand handling equipment which is of the overhead type was furnished by C. O. Bartlett & Snow Co., Cleveland. As molds are shaken out at two stations the sand falls through grids to a pit which is constructed of reinforced concrete and which is roofed over for almost its complete length by a steel deck. Along the floor of the pit is a reciprocating conveyor which drags the sand forward to an elevator boot. The sand is then elevated to a revolving screen



THE mold conveyor track is rectangular

*See THE IRON AGE, Sept. 27, 1934, page 13.

Car Wheels

By ROGERS A. FISKE

Western Editor, *The Iron Age*

which discharges cleaned sand to an overhead belt conveyor which extends over a National Engineering Co., Chicago, muller and over the tops of three overhead rectangular storage bins.

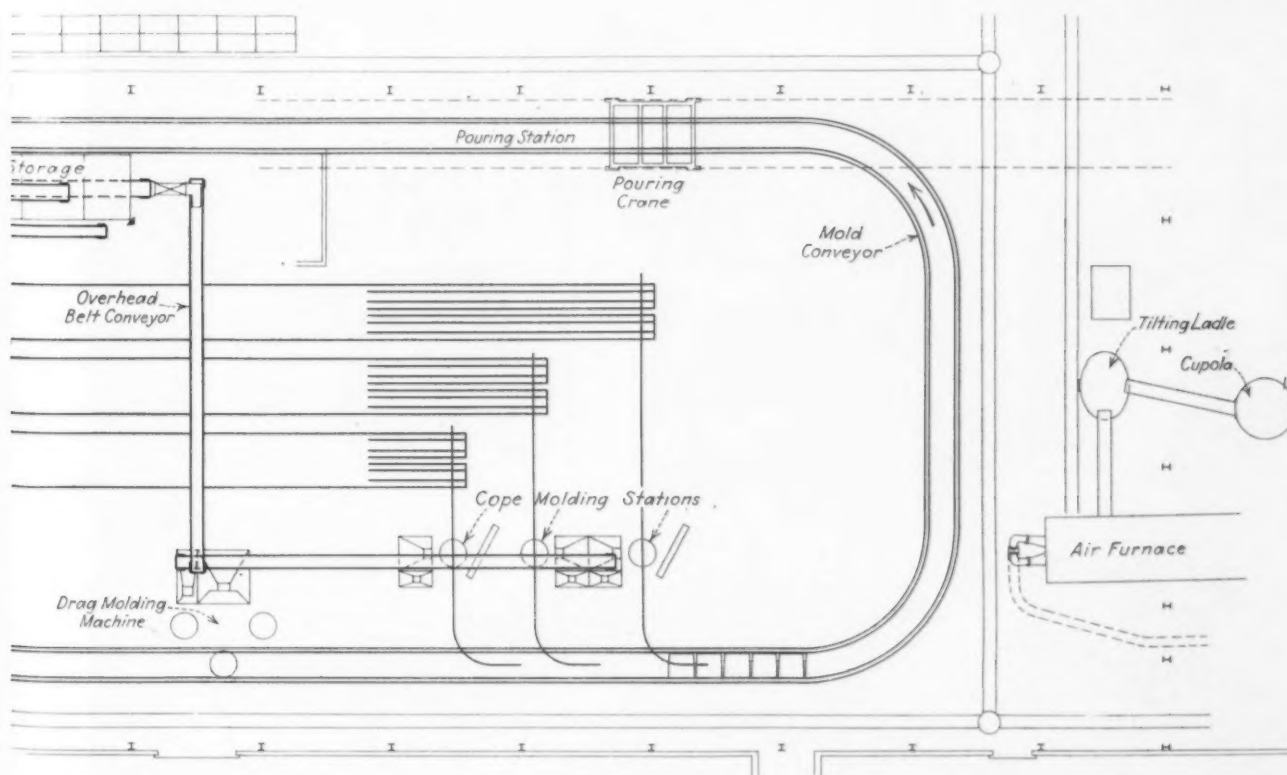
A scraper removes from this belt that part of the sand which is to be prepared for facing. A bin located over the muller provides needed storage. After passing the muller the prepared facing sand drops to a low level belt conveyor which delivers the sand to an inclined belt conveyor and which in turn delivers the facing sand to the aerator made by Royer Foundry & Machine Co., Wilkes-Barre, Pa.

The sand then drops into an overhead storage bin.

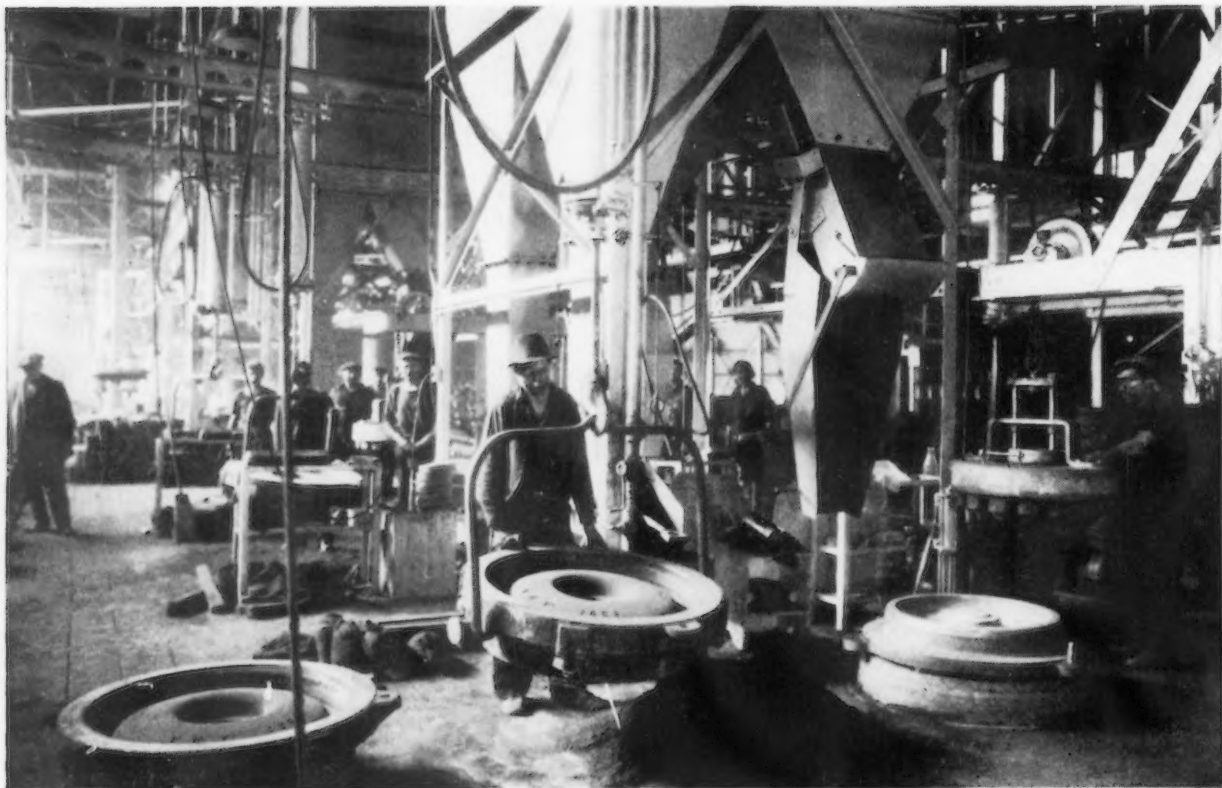
The three molding sand storage bins and the facing sand bin are in line so that a single belt conveyor can take sand from any bin and deliver it to an elevator which discharges on an overhead belt conveyor delivering sand to any one of eight overhead bins which serve the molding stations. This distributing system is operated intermittently and delivers either facing or backing sand as required to keep supplies ahead of the molders. Make up sand is put on the molds before they reach the shake-out.

Inasmuch as the ventilation system serves the shake-out pit in a major way, it will be well to point out its features. Leading from the shake-out pit are large air ducts that are connected to motor driven ventilating fans. Over the shake-out floor are fresh air ducts with large openings. These are also connected to fans.

The air suction ducts that are connected to the ends of the pit in the space directly under the pit deck remove by means of fans 36,000 cu. ft. of air per minute. Directly over the shake-out workers are air-duct openings through which is discharged 25,000 cu. ft.



in shape, affording a straight run of track at the shakeout pit.

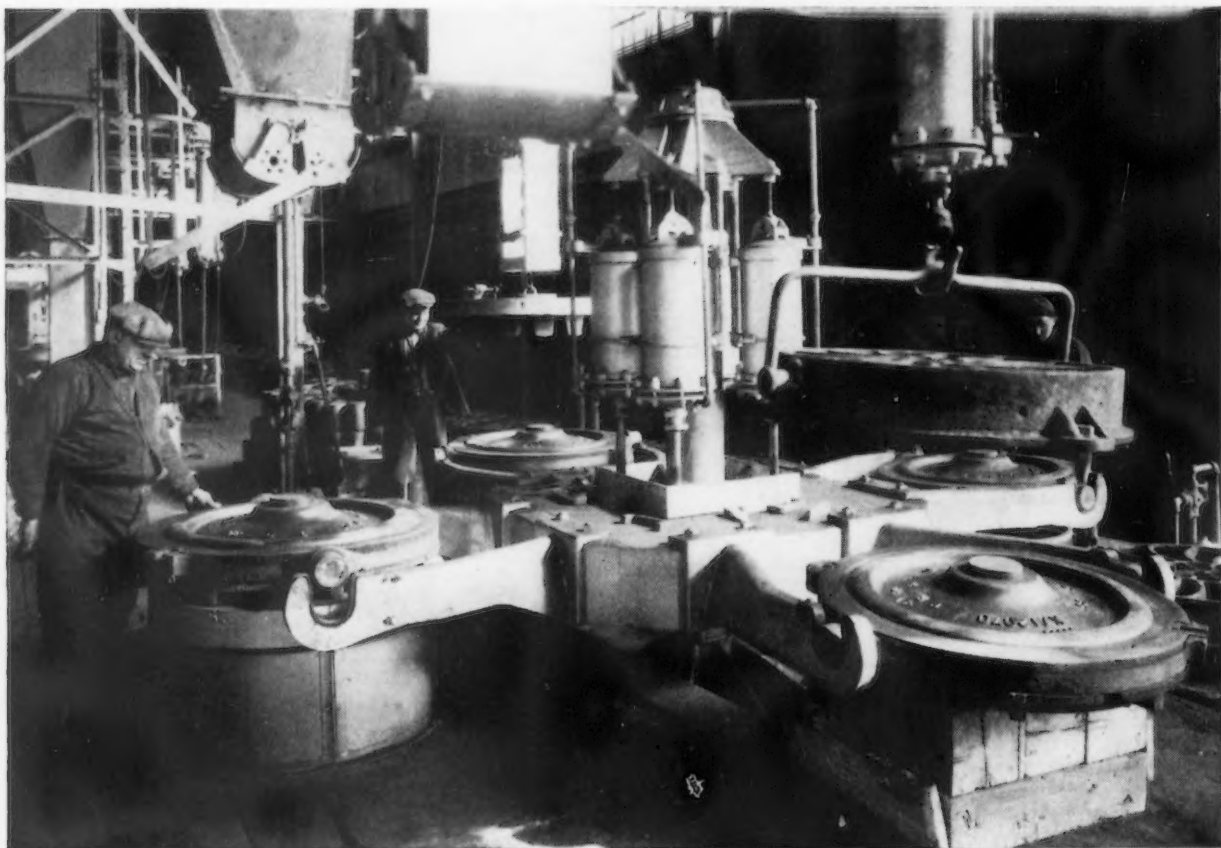


THIS is one of the cope molding stations showing jolting machine set in the floor and a complete cope being transported by an air hoist trolley.

o o o

THE drag molding machine consists of a yoke to which are attached four forked arms each of which carries a pattern. Note jolting machine below the pattern at the left.

o o o



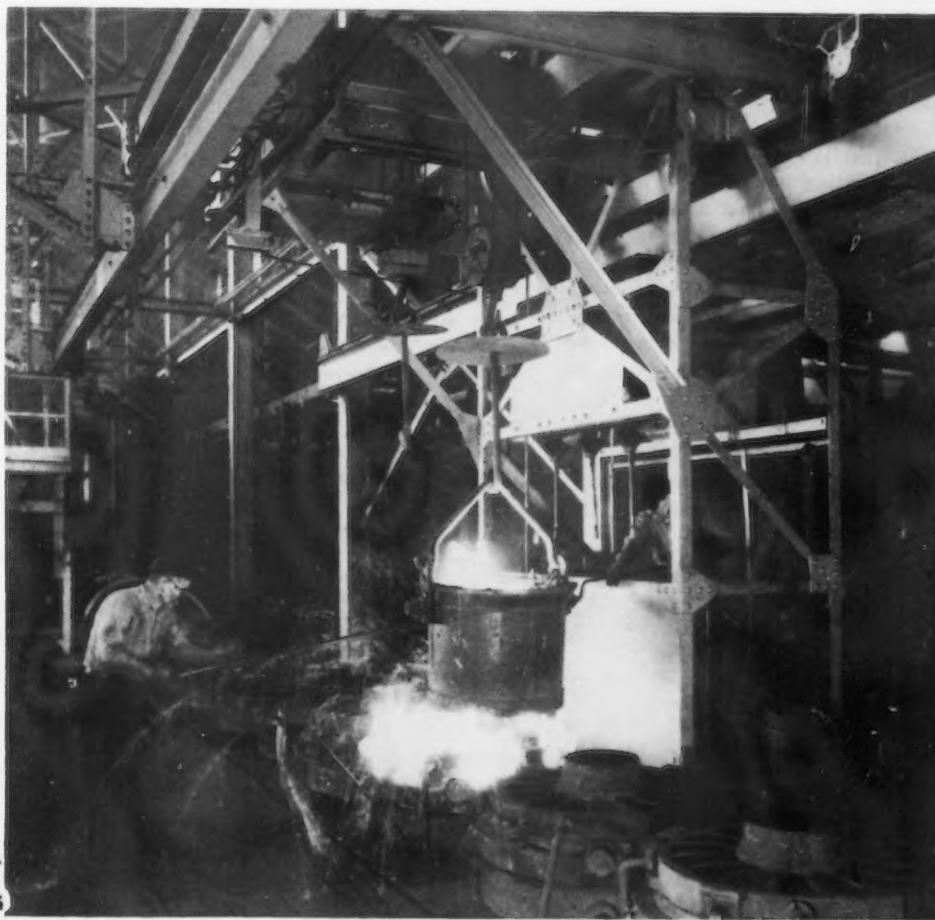
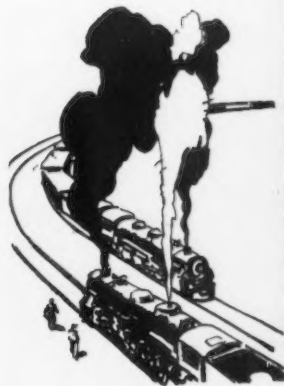
of air per min. which is taken from outside the building. This air is blown down toward the pit deck and near the shake-out grills. Suction air ducts also lead from the ends of the pit. These draw the dust laden air from the reciprocating conveyor space. The result of this is that this foundry is amazingly free from dust.

As an effective effort to keep

When flasks are shaken out the copes are swung over the mold conveyor by an overhead trolley and are deposited on light channel section skids which are placed on a transfer car, the top of which consists of two short sections of roller conveyor. The top of this car is level with the tops of six long stretches of roller conveyors which extend from the shake-out

of drags reaching the drag molding station. The completed drags move about 40 ft. to the point where the copes are fitted. The completed mold then travels around to the opposite side of the rectangle to the pouring station. The speed of the conveyor is such that after pouring sufficient time for solidification of the iron is given before shaking out. All of

EACH bottom pour ladle has a capacity of two wheels. In the background is the sheet metal mold conveyor hood which keeps gases from the room.



gases out of the air a sheet metal hood covers the mold conveyor from the end of the pouring line for a distance of about 60 ft. This hood is connected to an induced draft stack and all gases arising from newly poured molds are discharged outside of the foundry building.

Mold Transportation

Molds are conveyed on flat-topped, two wheeled cars that are coupled together in an endless chain. These cars travel on a narrow gage track which instead of being elliptical is more the shape of a rectangle, the two ends affording stretches of straight track.

station to points opposite the three cope molding stations. When three or four copes have been piled on the skids the car is pushed opposite one of the long roller conveyor lines and the load is then pushed off the car to the roller line, which is pitched so that the copes move by gravity to the end of the roller conveyor where they are handy for the cope molders.

A Steady Flow of Drags

As each drag is shaken out it is replaced on a mold conveyor car where it stands on metal lugs which project through the sand that covers the top of the car. By this means, there is a steady flow

these wheels pass to soaking pits and the object is to shake out as soon as practicable in order to hold the average temperature of the wheel at or above 1500 deg. F. when it is placed into a soaking pit.

Making Drag Molds

Making drag molds in this foundry is of particular interest for the reason that here car-wheel molds are machine made. The drag machine consists of a mast over which is mounted a yoke or guide from which are extended four forked arms, each designed to hold a pattern. By means of air cylinders this yoke can be moved up and down on the mast and it

also can be turned, the actual turning motion being through an arc of 90 deg. for each of four operations.

One arm always projects out over the table conveyor. An empty drag is lifted from a conveyor car and placed on a pattern which hangs by means of trunnions in the forked arm at the first operation station. The first operator now has the empty drag on a pattern in front of him. He mechanically riddles in the facing sand and the yoke is raised and revolved 90 deg. to the second station where the backing sand is drawn from a chute. The yoke is then lowered which brings the pattern to rest on a jolting machine. Three or four jolts are given and the sand is struck off, after which the yoke is raised and the arm swings to the third station where the pattern is lowered to another jolting machine and the mold is again jolted with a 1500 lb. ramming plate in place. Another swing of 90 deg. and an operator draws the pattern and finishes the drag after which it is placed on a conveyor table. It should be understood that the

yoke, carrying four arms and four patterns, is moved up and down as required and the operator at each of the four stations must do his part of the work when the yoke is in the down position. However, the two operators at the jolting machines have air valves by which they control the exact time and amount of jolting. The significant point is that drags for wheel molds are made by a continuous process with all of the old drudgery removed. Bottom plates are not used.

Cope Molding

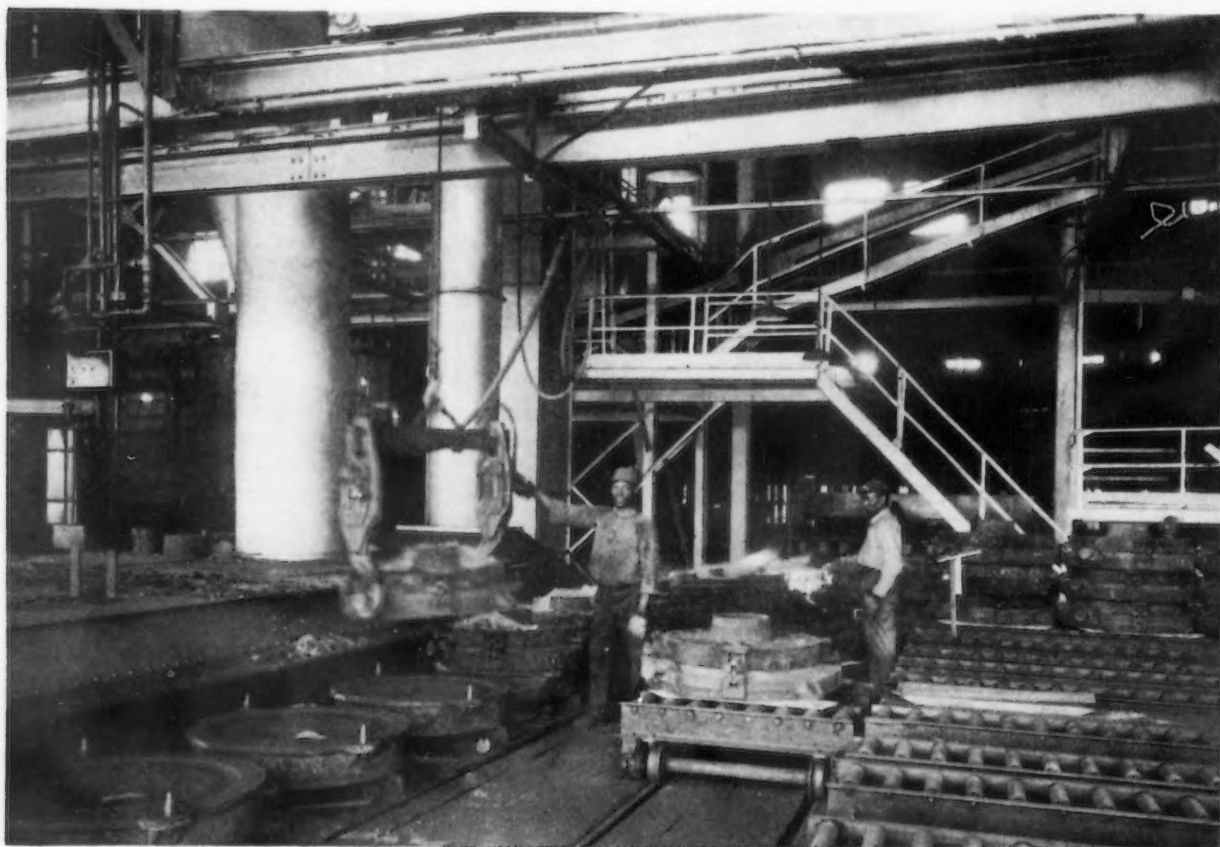
There are three cope molding stations, each consisting of overhead sand supplies and a jolting machine. Overhead tram-rails extend from the cope storage conveyor over the jolting machines and on over the car conveyor. Complete cope molds are made at each station. A cope is brought from storage and placed over the pattern which is mounted on a jolting machine. Here again a ramming plate is used which is suspended from a post crane which is operated by an air cylinder.

Movement of the car or table con-

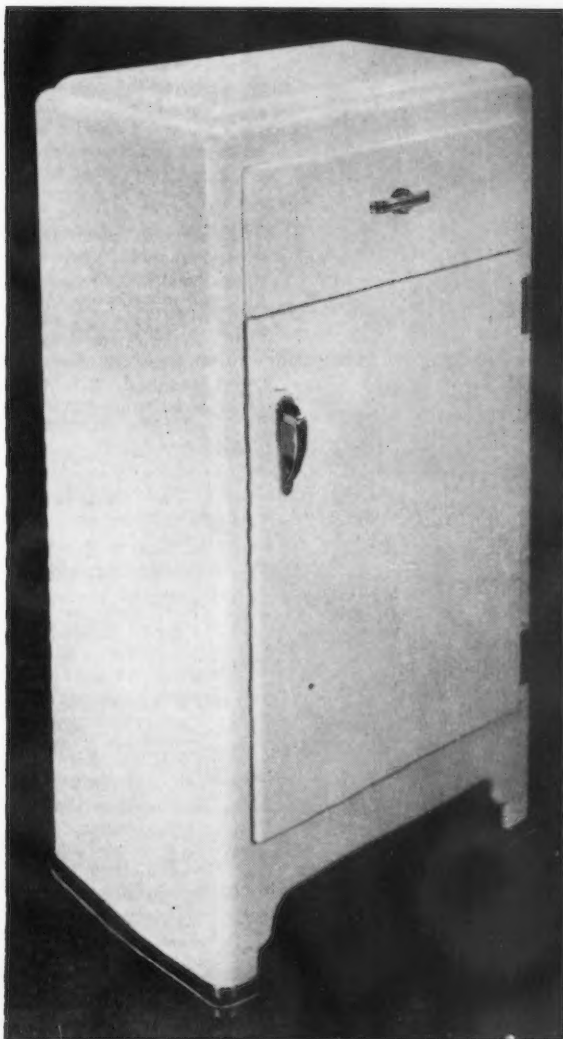
veyor is controlled from the drag molding station. This conveyor is actuated by a single acting air cylinder, the piston of which is returned in the one direction by a weight suspended by cables that are guided over pulleys.

The deck over the shake-out pit is arranged with four grids, two being used for copes and two for drags. Two grids are arranged with center blocks on which the wheels drop when first shaken out of the flasks. Risers are carefully removed and are tossed into a dump car which travels on rails parallel to the shake-out pit. The wheels go to the soaking pits. The drags and copes are further shaken out over plain grids by means of vibrators suspended from overhead.

This new foundry has a capacity of 1000 wheels in two 8-hr. shifts. The absence of dust, ample glass area and high overhead space make this foundry a desirable work shop. It strikes a glaring contrast between foundry practice and design today and the best that was to have been had only a few years ago.



THE shake-out deck is at the left. Drags are replaced on the mold conveyor. Copes are placed on the transfer car and delivered to the inclined roller conveyors for storage.

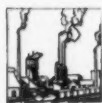


THE newly designed refrigerator, showing the change in the design of the top and sides and the use of a stainless steel strip around the bottom.

Improved Methods Used in Making New Model Refrigerator

By F. L. PRENTISS

*Cleveland Resident Editor,
The Iron Age*



PRODUCTION of electric refrigerators by the Westinghouse Electric & Mfg. Co., in its Mansfield, Ohio, plant has been sharply increased. This was brought about by speeding up the final assembly line and putting additional workers on the line, by more rapid movement of parts through baking ovens, made possible by increasing conveyor speeds and increasing oven temperatures, by hanging work closer together on overhead conveyors, by rearranging press equipment for straight line production and by adopting new production methods that tend to cut down costs.

New economies in the press shop also include the use of universal

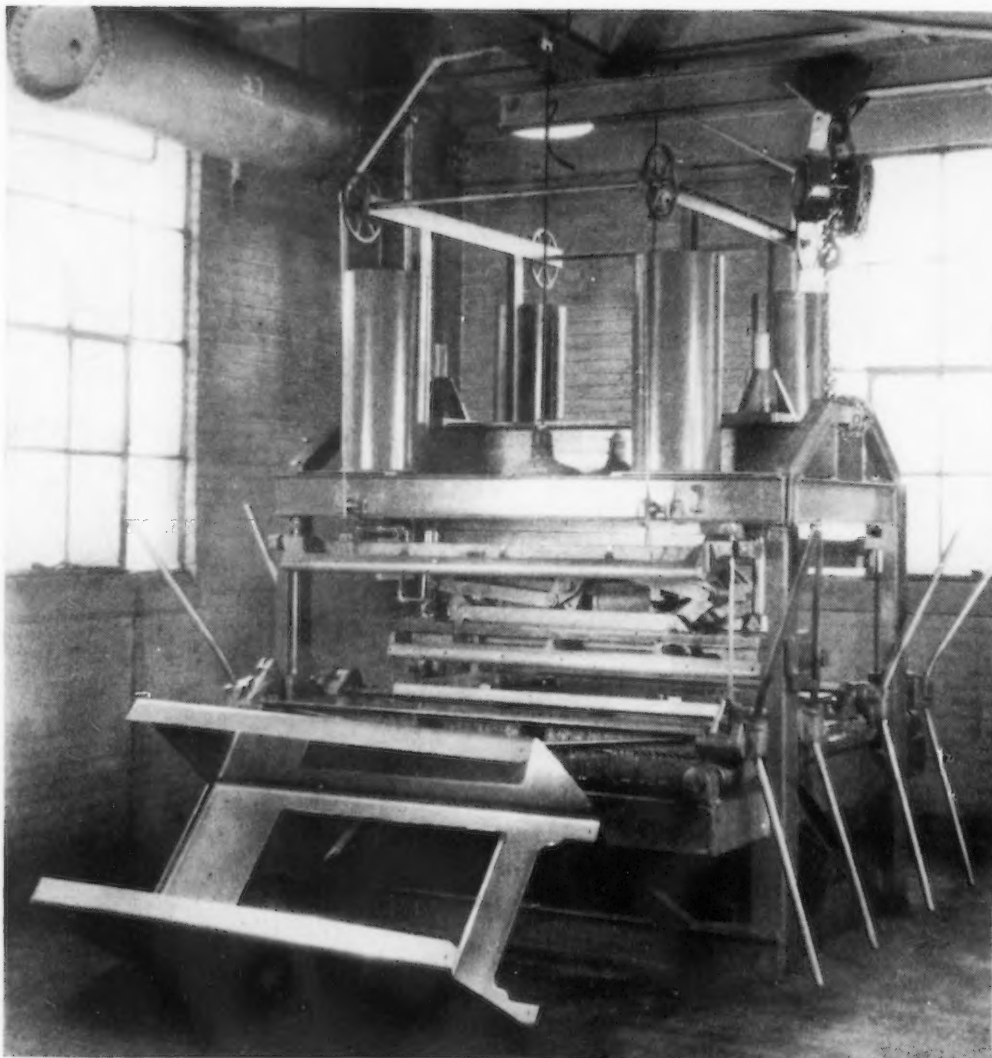
dies quickly adjustable on universal bed plates for different sizes, reducing the number of dies required, the use of new metal forming equipment and the combination of operations on punch presses—changes that have resulted in less handling of work in process and increased output.

Changes made a year ago in the production line which were brought about largely by the adoption of Dulux as a coating for refrigerator cabinets were described in an article in THE IRON AGE of June 7, 1934. The general plan of routing on an overhead chain conveyor on which the cabinet and parts are hung after cleaning and on which they remain through the spraying and baking operations and until

they reach the final assembly line, as described in that article, has not been changed.

Cost of Stock Records Eliminated

But speeds have been increased in various stages of production, and it may be said that rapid movement of work in process appears to be a watchword of the plant. Steel sheets, in exceptional cases, have been shipped out as a part of a finished refrigerator within 24 hr. after they were received in the plant. There is a turn-over twice a month of sheet steel used in production work on cabinets, a turn-over in five days of fabricated sheet metal parts and a turn-over five times a day on insulating material. No record is



AT LEFT

NEW machines in which are combined the operations of forming door opening flanges and the folding of a sheet to form the front, sides and two narrow flanges on the back for a refrigerator shell. With this machine two men produce more shells than four did when the hand brake method of forming was used. A formed shell is shown in front of the machine.

o o o

BELOW AT RIGHT

THE new cleaning and Bonderizing department. Refrigerator shells and parts, suspended from carriages attached to electric hoists on the tram-rail, are dipped in five tanks at the left for cleaning, and loop around on the tram-rail line to two Bonderizing tanks at the right. The movement of the work both in and out of the tanks and around the tram-rail line is automatically controlled.

kept of fabricated parts in stock. Instead a physical inventory is made at the end of every month. This procedure is found to be more accurate than written records and eliminates the cost of stock records.

Effect of Style on Design and Construction

With the sales value of appearance fully appreciated, the 1935 Westinghouse refrigerator is of more graceful appearance than its predecessors. Attention is called to its "streamline" body in the company's publicity matter. Some of the changes in design that have been made purely for appearance's sake involved changes in parts and certain construction features.

The cap in the 1934 models fitted over the outside of the top of the shell. In the new model the cap drops into the top of the shell, fitting inside of the shell flange and necessitating four additional brackets to support the cap. An

auxiliary panel $\frac{7}{8}$ in. deep is now placed above the door, giving the door a more flush appearance. The top is more attractive looking by being given a more rounded effect. This is accomplished by increasing the radius at the top corner from $\frac{1}{2}$ to $1 \frac{3}{16}$ in. Legs still are an essential part of the refrigerator cabinet but they have been concealed by extending the sides down to the floor, to accentuate the streamline appearance.

Stainless steel is now being used for decorative purposes, some of the models that have a porcelain enamel finish having a stainless steel band $2\frac{1}{4}$ in. wide around the bottom of the cabinet.

Presses Arranged for Straight-Line Production

Returning to the changes made to reduce operating costs, the press shop equipment has been rearranged with the presses grouped for straight-line production of sev-

eral refrigerator cabinet parts which require a number of operations. For example, in making a door outer panel there is a straight line of punch presses for the following progressive operations: shearing the blank to size; trimming hinged side; drawing; trimming four corners in two strokes, two corners at a stroke; curling four corners in two strokes, two corners at a stroke; curling bottom; curling top; curling hinged side; curling latch side; piercing hinge holes and piercing latch holes.

Adjustable dies for making similar parts in five lengths and widths are used for some forming, punching, piercing, trimming and curling operations. Blanking and forming of the outer door panels in five sizes are done on a single set of dies, adjustable dies being used for all the operations except drawing. For piercing and for trimming the corners of the bottom pan there are four die sets mounted on a master

locating plate. One of these dies is stationary and the others are located by dowel-pins, permitting these dies to be adjustable both for width and length.

Cast forming dies are used when possible. These, made of Meehanite or high-tensile iron with a nickel content, take the place of built-up dies. These dies are cast to shape and size with an allowance of $\frac{1}{4}$ in. metal for machining. They are heat treated to a 275 Brinell hardness before machining.

Cabinet Body Made in New Forming Machine

A highly efficient forming machine of welded steel construction, which was developed by Westinghouse engineers and built by the company, is used for forming the door opening and forming the shell of the cabinet. One piece forms the front and two sides of the cabinet body and a narrow flange at the back. A second piece forms the back. Formerly the door opening was made with a power press and the blank then went to a hand brake in which the sheet was folded up to form the front and sides of the shell and the flange at the back

to which the back section is welded later.

According to the new method, the large blank that is formed into the front and sides of the box is laid in the forming machine and clamped by two air cylinders which, with an air pressure of 120 lb., hold it firmly in position during the operations. First the door opening flanges are formed. Then a set of hand operated brakes on either side form the two back flanges simultaneously, after which another set of brakes bend the two sides making the front corner and completing the forming of the shell. Clamps on either side slide in guides and are counterweighted for ease in raising and lowering. By the substitution of complete brake blade units, shells in five sizes may be made on this forming machine.

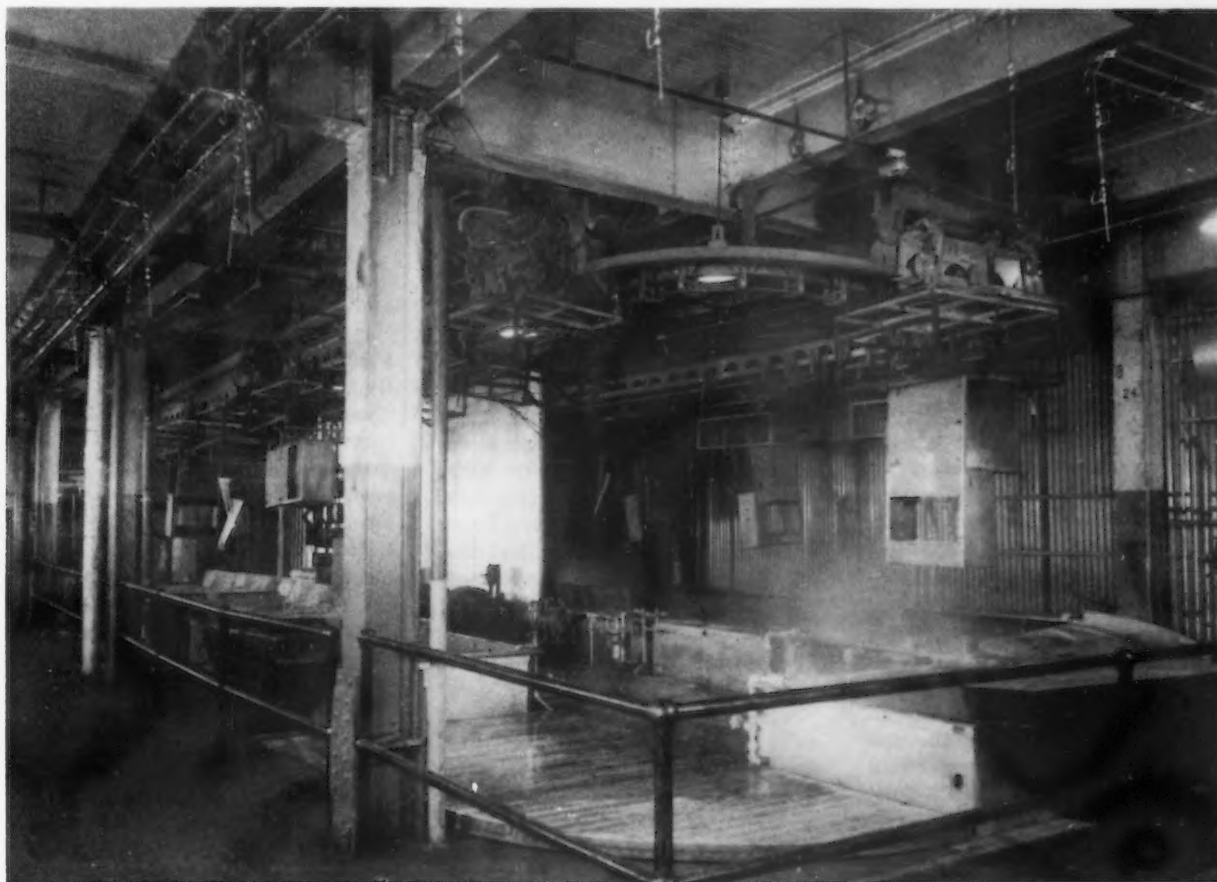
Refrigerator cabinet shells are formed at a high production speed on the machine. Two men form more shells than four were able to make with the former method of forming the door opening on a punch press and then performing the successive forming operations on conventional-type brakes.

Because of large top corners, gas welding has been substituted for spot welding for joining the corners. The line of electric welding machines of the resistance type for various other operations has not been changed.

Metal Is Clean and Bonderized

Cabinets and parts are cleaned and then rust-proofed by the bonderizing process. Cleaning is done in a series of five tanks. To increase cleaning capacity, cleaning by dipping in solutions has replaced a vapor degreasing system that was used for some time. Work is handled through the cleaning and bonderizing department by a tramrail system. Pieces are suspended from carriages attached to electric hoists on the conveyor. Automatic control is provided for dipping the pieces into the tanks and lifting them out. This system, installed by the Cleveland Crane & Engineering Co., is similar to that which was previously used but has been extended to meet the requirements of the present cleaning and bonderizing department.

Shells and parts are cleaned in a soap solution. The first tank is for cleaning, the second for rins-



ing, the third for cleaning and the fourth and fifth for rinsing, first in cold and then warm water. A weak muriatic acid rinse is given in the last two tanks.

After the final rinsing the work is hand wiped and loops around on the conveyor to two bonderizing tanks. Then it is rinsed in cold water and in another tank containing a chromic acid solution, after which the parts are dried and hand wiped.

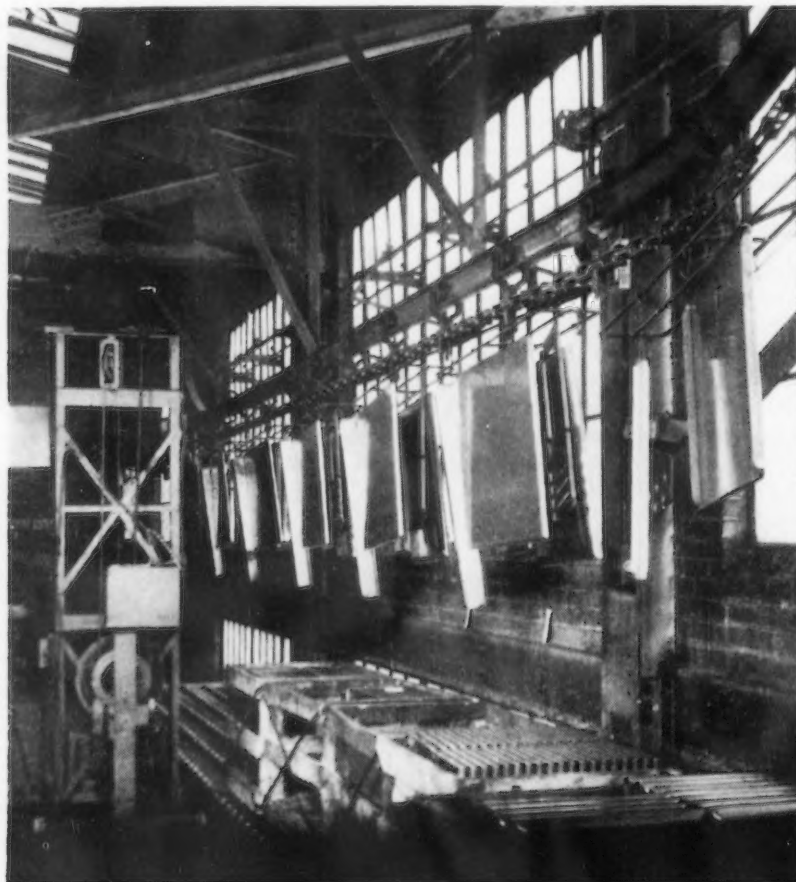
on the conveyor. Formerly alternate hooks were used on this conveyor line for a cabinet and its parts. Now two sets of parts are hung on a single hook so that three hooks instead of four hold two cabinets and all their parts.

New Method of Handling and Storing Parts

A new method of handling and storing parts is provided in a new parts storage department. When

racks three sections high, separated by narrow aisles, extend across this room and in these racks parts are stored in metal-bound wooden tote boxes. Along each end of the row of racks a three-high "decker," electrically operated by a cable attached to an automatic reel fastened to the ceiling, runs on a rail track. The decker is spotted at the end of a rack from which parts are to be taken and its lift platform is raised to the proper level and the tote boxes are shoved from the rack to the decker. The decker then moves a few feet along the track, and the boxes of parts are deposited on a table having a ball top which makes it easy to shove the boxes on the table. From this table the parts are hung on the conveyor directly overhead, which carries them to the cleaning and bonderizing department.

Extending along the opposite or loading end of the storage racks there is another transverse track and a second cable-operated decker which is used for loading incoming parts into the storage racks.



VIEW at the end of the new parts storage department. Refrigerator parts handled in tote boxes are stored in rows of steel racks from which the tote boxes are shoved on the lift-platform decker that runs on a track along the end of the racks. From the decker the boxes of parts are placed on the ball top table at the right, from which they are hung on the overhead chain conveyor which takes them to the cleaning and Bonderizing department. This conveyor acts as a traveling store room.

The cabinets and parts are then transferred from the cleaning room conveyor to the chain-type overhead conveyor, which carries them through the spraying department for the priming and finishing coats and other operations incidental to coating and then through the baking ovens. The speed of this conveyor has been stepped up, and its capacity and consequently production have been increased by hanging the pieces closer together

a cabinet goes from the metal finishing to the cleaning and bonderizing department, a complete set of its component parts is delivered to the conveyor in that department by an overhead chain.

This parts conveyor, which acts as a traveling store room, runs from the parts storage department in another section of the building in which convenient methods are provided for the storage and handling of parts. Roller-type steel

Widespread Observatory Construction Planned

(CONCLUDED FROM PAGE 21)

tube were shipped by steamer around Cape Horn to Los Angeles Harbor.

The tubes of such telescopes are hung in rectangular steel yokes and the bearings relieved by mercury flotation systems with drums over north and south pedestals. By this method telescopes weighing upward of 100 tons are easily moved to follow the course of the stars as, due to the earth's rotation, they appear to move through the sky from east to west. The telescopes are driven by a clock mounted in a separate room, and the clock is actuated by a heavy weight. By means of a worm gear, a huge wheel attached to the polar axis is driven.

Apart from the main telescopes at observatories, there are a number of auxiliary astronomical instruments, such as interferometers, etc., which also are mounted in structural steel frameworks.

How to Bring Out New Products

By JOHN ALLEN MURPHY

THE new product should be related to the present line and it should be suited to the manufacturer's production facilities



WHAT is happening to the new product boom? For several years there has been an amazing activity in the bringing out of new products. The craze still continues. Almost every manufacturer one knows is launching new products. In a number of cases the old line has been given up altogether. Concerns that achieved prestige making this or that for a generation or two have suddenly thrown all their resources behind a new article. Companies that are not exploiting new wares are redesigning or refurbishing or repackaging their old wares. Retailers, it would appear, are merchandising scarcely

anything but new things. Wholesale distributors are not interested in your offerings unless you have something new to show them.

And yet many manufacturers, who have added new products, are bitterly disappointed with the results. Too large a percentage of these new things have proven to be complete flops. It is no secret that the majority of the things that were taken on in recent years with such high hopes and which were offered with so much ballyhoo, have not earned their salt. Why?

Getting into a Foreign Business

The answer is not hard to find. Too often manufacturers do not use judgment in selecting new products. They add things that are too foreign to their present lines. They are too prone to become enamored with articles, the making of which virtually takes them into another kind of business.

They switch into the production of new lines for which their manufacturing facilities are not adapted. They bring out new products which cannot be distributed through their customary marketing channels.

That these statements are true is proven by the fact that those companies that are making a success of new products are sticking to articles that are closely related to the lines that they have been manufacturing. For example, if the Lionel Corp'n. had begun to can cranberry juice, instead of bringing out a Mickey Mouse handcar, the chances are overwhelming that the profits on the venture would not have pulled the company out of the hands of receivers. Fortunately, however, the Lionel Corp'n., which is perhaps our largest manufacturer of toy electric trains, put out a handcar, which is operated by Mickey and Minnie. The result

(CONTINUED ON PAGE 86)

Activities Bearing on Machine Tools Distribution

• • •
*A Department Conducted
by L. M. Waite*
• • •

THERE is a considerable amount of trend-indication as to machine tool distribution involved in what is actually taking place in "Dealer Territories," as sub-divisions of dealer coverage are called within the machine tool trade.

The Iron Age proposes to make this indication available to readers through a cooperative news column published at frequent intervals as warranted by interest shown; items submitted by those active in the manufacture, distribution or use of these durable goods will be edited and used. Sales organizations of manufacturers as well as dealer heads have expressed a desire to contribute regularly to such a column. Orders, inquiries, personals covering sales organizations and key-men in shops, agency arrangements, employment conditions, new things, production schedules in either machine tool shops or shops using machine tools, plans for expansions, get-togethers, local or otherwise, territorial policies, etc., all indicate the degree of activity prevailing.

Known breadth of activity is a potent factor in order decisions.

Associated Machine Tool Dealers

THE Associated Machine Tool Dealers membership has long been made up largely of cooperating dealer and agent companies. These have sales personnel with the necessary ability to arouse shop interest in the economies made possible by modern machine tools. This sort of ability, when coupled with frequent contacts, is the forerunner of ultimate decisions leading to sales of the many standard and specialized machine tools developed by machine tool builders for purposes of either or both increased production and lowered costs.

Over a period of years there has been a steady and increasingly

evident purpose within the dealer association to work out, with machine builders, constructive record information concerning machine tools, their adaptabilities, and demonstrated accomplishments. It has been the association aim to have such information in forms particularly suited to preliminary introductions, to prospective surveys and to discussions among key men in shops.

Dealer Service

This has been with the idea of rendering informatory service to individuals having buying influence. It has had in mind also the rendering of a rationalized service to machine tool makers by consistently carrying on systematic pres-

entations that call attention to the ultimate cost advantages of modern design, as incorporated in modern equipment.

Over wide areas of the metal-working industries, the association has made effective many betterments in distribution technique involving not only dealers and machine tool builders, but purchasers as well. From the viewpoint of cooperation within territorial metal trades districts, it has served well in putting its member activities more nearly on a plane with the economic importance of wise equipment selection.

Cooperative Get-Togethers

Many accomplishments of the association are traceable to its frequently held meetings and to the close contacts maintained among association dealer executives within the wide territory of membership coverage. The unified purpose that has resulted has tended not only to create a wide cooperative spirit among dealers and also among dealers and makers, but has served to provide the individual dealer organization with a more thorough technical knowledge of and a broader viewpoint concerning production problems of particular classes of shops.

This has reacted to the benefit of the prospective purchaser because it has removed previous barriers often set up as a result of contacts too restricted in scope.

Occasionally we hear that "the

dealer is on the way out," to be superseded by some form of direct representative plan. This is possibly best answered by the background and length of service of many in the present membership list, appended hereto, of the Associated Machine Tool Dealers. The

record of these companies may be said to compare favorably with that of any group which has a place in our general scheme of distribution. Nor is such a list by any means a complete tabulation of the dealers and agencies available to render something other than price-

service to both purchaser and maker. It is, however, quite representative of companies having a well-equipped organization and progressive, exclusive connections with which to render intimate service in engineering cooperation, as well as in purely sales directions,

ASSOCIATED MACHINE TOOL DEALERS MEMBERSHIP LIST

Arch Machinery Co., Inc.,
1001 Park Building,
Pittsburgh.

Barney Machinery Co., Inc.,
2410 Koppers Building,
Pittsburgh.

Blackman Hill & Co.,
1513 North Broadway,
St. Louis.

Brown & Zortman Machinery Co.,
129 McKean Street,
S. S. Pittsburgh.

Bryant Machinery & Eng. Co.,
400 West Madison Street,
Chicago.

Cadillac Machinery Co.,
528 Fisher Building,
Detroit.

Calco Machinery Co.,
1420 Chestnut Street,
Philadelphia.

Cleveland Tool & Supply Co.,
1427 West Sixth Street,
Cleveland.

Colcord-Wright Machy. & Sup. Co.,
1229 North Broadway
St. Louis.

Crane Machinery Co., R. L.,
501 Morgan Building,
Buffalo, N. Y.

Elliott & Stephens Machy. Co.,
Mart Building,
St. Louis.

English & Miller Machy. Co.,
Boulevard Temple Building,
Detroit.

Essley Machinery Co., E. L.,
825-45 Rees Street,
Lincoln Park Station, Chicago.

Federal Machinery Sales Co.,
17 North Jefferson Street,
Chicago.

General Machinery Corp.,
148 Federal Street,
Boston.

Gosiger Machinery Co., C. H.,
Bacon & McDounough Street,
Dayton, Ohio.

Hallidie Machinery Co., Inc.,
2242 First Avenue South,
Seattle, Wash.

Harron Rickard & McCone Co.,
1600 Bryant Street,
San Francisco.

Herberts Machinery Co., Ltd.,
2929 Santa Fe Ave.,
Los Angeles.

Herberts-Moore Machinery Co.,
550 Fifth Street,
San Francisco.

Kinsey Co., E. A.,
331 Fourth Street West,
Cincinnati.

Lynd-Farquhar Co.,
326 Congress Street,
Boston.

Machine Tool & Supply Co.,
215 Second Street,
Tulsa, Okla.

Marshall & Huschart Machinery Co.,
1020 Chamber of Commerce Building,
Indianapolis, Ind.

Marshall & Huschart Machinery Co.,
571 West Washington Boulevard,
Chicago.

Motch & Merryweather Machinery Co.,
Penton Building,
Cleveland.

National Supply Co.,
384 South Erie Street,
P. O. Box 899,
Toledo, Ohio.

Neff Kohlbush & Bissell, Inc.,
2400 West Madison Street,
Chicago.

Owens Machinery Co., J. F.,
1602 State Tower Building,
Syracuse, N. Y.

Peden Company,
700 North Jacinto Street,
Houston, Tex.

Peninsular Machinery Co.,
2921 East Grand Boulevard,
Detroit.

Prentiss & Co., Henry,
Box 428 Grand Central Annex,
Chrysler Building,
New York.

Robinson, Cary & Sands Co.,
41 East Fourth Street,
St. Paul, Minn.

Ryerson & Son, Jos. T.,
2558 West Sixteenth Street,
Chicago, Ill.

Satterlee Co., F. E.,
118 Washington Street,
Minneapolis, Minn.

Schiefer Machy. Co., F. W.,
425 Power Building,
Rochester, N. Y.

Seifreath-Elstad Machy Co.,
1840 Howell Avenue,
Dayton, Ohio.

ShIPLEY Machinery Co., W. E.,
1421 Chestnut Street,
Philadelphia.

Smith Booth Usher Co.,
2001 Santa Fe Avenue,
Los Angeles.

Smith Machinery Co., H. A.,
501 East Water Street,
Syracuse, N. Y.

Somers, Fittler & Todd Co.,
323 Water Street,
Pittsburgh.

Stamets, William K.,
4026 Jenkins Arcade Building,
Pittsburgh.

Stedfast & Roulston, Inc.,
156 Oliver Street,
Boston.

Strelinger Co., Charles A.,
141-149 Larned Street East,
Detroit.

Strong Carlisle & Hammond Co.,
1302 West Third Street,
Cleveland.

Strong, Inc., Homer,
285 State Street,
Rochester, N. Y.

Swind Machinery Co.,
Broad Street Station Building,
Philadelphia.

Syracuse Supply Co.,
314 West Fayette Street,
Syracuse, N. Y.

Triplex Machine Tool Co.,
125 Barclay Street, Cor.
West,
New York.

Vandyck Churchill Co.,
114 Liberty Street,
New York.

Wachs Gregg & Co.,
117 North Jefferson Street,
Chicago.

Wilson Brown, Inc.,
30 Church Street,
New York.

Keeping Conveyor Trolley Wheels Lubricated

By JAMES B. KIRK

Secretary-treasurer, Peninsular Metal Products Co., Detroit

LAST summer we found that keeping 3700 wheels on three-quarters of a mile of overhead conveyor properly lubricated presented a serious problem. We make metal door and window frames, instrument panels and other light automotive stampings and our entire output is kept moving through processes by overhead conveyor.

This particular conveyor passes through enamel ovens, tending to cake and break down lubricant in the wheel bearings and making necessary repeated application of lubricants. Various mechanical devices were tried and manual application was found to be effective but very expensive because of labor cost and the waste of lubricant. None of these methods obviated the tendency of the lubricant to drip from the trolley to the work being carried. Spoilage charges

were high. Unoiled wheels, or those poorly lubricated, froze, which wasted power. When a sufficient number froze, the drag resulted in chain breakage and that meant expensive "down time."

In cooperation with F. Bjerre, engineer, J. N. Fauver Co., Detroit, a new type of pneumatic lubricator was developed and placed in service. This mechanism includes a number of standard Norgren units. Our plant air pressure is reduced to operating pressure by a Norgren reducing valve. The air then passes through a Norgren air line lubricator which introduces into the air stream, a drop at a time, lubricating oil of the proper viscosity. Thus a fog of oil leaves the air line lubricator and is held under air pressure for application to the trolley wheel bearings. The bearing lubricator consists of a unit built of cold-

rolled steel, attached by four machine screws to the top of the conveyor rail. It includes a Norgren blow valve.

As each pair of trolley wheels passes under the lubricator it trips a pair of triggers which automatically (by actuating the blow valve) releases jets of fogged oil, forcing the lubricant directly into the bearings. Air pressure, oil volume and direction of jet are readily adjustable. The energy required to operate the device is supplied by the moving trolley. Oil storage of 1½ pt. is provided in the air line lubricator.

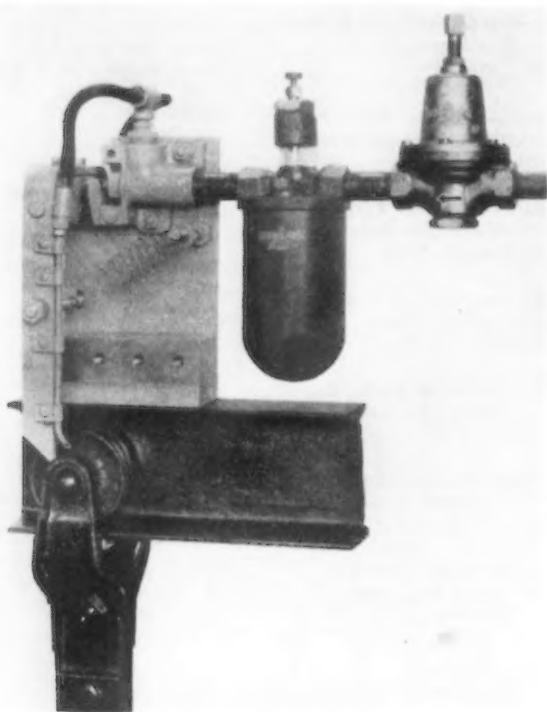
Installation of this lubrication equipment on the first conveyor eliminated the mechanical troubles we had previously experienced. We are saving lubricant, frozen trolley wheels no longer break chain and interrupt production and, because each wheel gets enough but not too much oil, work spoilage from dripping has been done away with. A second installation of this lubrication equipment, which is to be produced commercially by the Fauver Co., has just been made in our plant on a 2800-ft. conveyor line.

Air Conditioning Fully Covered

FOR those interested in the science of air engineering, which includes the conditioning and handling of air and gases, the American Blower Corp., Detroit, published on April 1 a 704-page book, "Air Conditioning and Engineering," which it has taken four and a half years to write and compile. Subjects treated in the first section of the book include air, heat, steam, air flow, sound, heating, ventilating, humidifying, dehumidifying, cooling, vapor absorption, drying, refrigeration, fume collection and removal, dust collection, pneumatic conveying, humidity control, ceramics and furnaces.

Fundamental principles, laws and tables which have been determined experimentally or mathematically are given. Sample calculations in considerable detail and information on dimensions and capacities, as well as application data, are printed. All subjects are treated practically so that users can solve air engineering problems using the data given, requiring only the aid of experienced fan engineers on exacting or complex applications.

The second section of the book is given over to descriptions of
(CONTINUED ON PAGE 37)



PNEUMATIC lubricator developed to assure proper oiling of conveyor trolley wheel bearings, and thus prevent spoilage of work from dripping and save power and chain breakage from "freezing" of the wheels. In the installation pictured, the direction of conveyor travel is to the left.



CHARLES J. STILWELL, 'President, National Machine Tool Builders' Association
Drawn by John Frew for The Iron Age.



apparatus and equipment. All subjects are indexed, charted, illustrated and cross-indexed to permit easy reference. The book is profusely interspersed with charts, photographs, drawings and tables. In the foreword to the book, the editors state that "a more congested population and more complex industry are calling upon this science (of air engineering) for assistance in the solution of many of their accumulating problems. Adequate ventilation and heating are essential to healthful living and working conditions."

Cites Danger of Tin Plate Scrap Exports

EXPORT to Japan of tin plate scrap from the United States was analyzed by W. J. Buttfield, president, Vulcan Detinning Co., in his annual statement to stockholders. He said in part:

Of serious moment is the increasing drain upon the company's sole detinnable raw material (tin plate scrap) by its exportation to Japan where the average wage of detinning companies is but one-tenth of that in this country. As stated recently in the Tokio press, detinners in Japan are straining to meet the "big demand for war supplies," and, as pointed out by the United States Department of Commerce, that nation is evidently intent upon building up chemical industries which will be independent of other nations in the event of a national emergency.

As indicated in previous advices, the tin situation has been under investigation by a special committee of the House Committee on Foreign Affairs, the stated purpose being to relieve the "costly and dangerously dependent position of the United States." Its report to Congress is expected daily. In the meantime an extensive report was made in January by the National Resources Board appointed in June, 1934, by the President. It contains the following most significant comments:

"Over the period 1924-1928, secondary tin production was 41 per cent of the metallic tin imported.

"The United States is the only important industrial nation that has no regulatory measures concerning the exportation of scrap. The exportation of tin scrap, which assumed comparatively large proportions in 1934, diverts from the secondary plants in the United States a large supply of crude material that they are amply equipped to handle, depletes the reserves of tin-bearing material in the United States, and weakens bargaining power as regards prices at which new supplies must be purchased.

"With respect to minerals for which the United States is largely dependent upon imports it is suggested that a wise policy should include . . . restriction or regulation of the export of scrap. America is the only industrial nation that does not regulate the export of scrap of strategic metals."

Preheating and Mixing of Food—A New Outlet for Steel and Machinery

A NEW application for iron and steel and machinery equipment is provided in a preheater for use in the manufacture of prepared food products. This is a continuous machine in which the products are preheated and mixed before being placed in the containers in which they go to the grocers' shelves. The use of this machine eliminates batch preparation of foods in open top kettles and the manual charging and discharging and the stirring of kettles, as is required in the batch-type method.

Food is fed into one end of a cylinder. It is carried through the cylinder by a series of arms attached to an agitator shaft mounted on a bronze bearing, which extends the length of the cylinder. One end of an arm provides a screw effect that advances the food, and the other end of the arm is equipped with a spring-con-

trolled scraper that continually cleans the food from the inner side of the shell or heating surface. When the food reaches the discharge end, it is entirely mixed. Heat is supplied between the cylinder and outer jacket.

The cylinder is of plain carbon or stainless or other alloy steel, and the cylinder and jacket are welded construction throughout. The machine is driven by a motor mounted above the cylinder. Advantages claimed for this method of preheating and mixing food include drastic saving in labor, reduction in heat losses, cleanliness and controlled mixer speed and temperature. The machine in the larger of two sizes has a capacity for preparing 6000 lb. per hr. of corned beef hash, mincemeat, deviled chicken or other food products. The mixer is a new product of the Patterson Foundry & Machine Co., East Liverpool, Ohio.

Attractive Steel House of Unique Construction

CONSTRUCTED under what is known as the "White System," the steel house shown in the accompanying picture presents some unusual features. It was built for the WDAE broadcasting station of Tampa, Fla., and is the first of its kind.

The construction employs trapezoidal sheet steel stampings of 29 gage or heavier stock, in sections 36 in. wide by 10 or 12 ft. in length. The sections interlock and avoid the necessity of framework. Similar sections to those employed for walls and partitions comprise floors, ceilings and roofs,

and thus the construction is said to lend itself readily to extensions or additions.

Concrete, stucco or similar materials are used as covering and it is stated will remain in position indefinitely, due to the anchorage provided by the trapezoidal sections.

The originator of this construction is H. E. White, of Lake Carroll, Tampa, Florida, who designed the compartment construction for the so-called nonsinkable battleship used by the U. S. Government during the world war.



THE IRON AGE, April 4, 1935—37



Improvements in Production

Automatic Screw Head Trimmer Uses Extrusion Chip-Parting

THE automatic accomplishment of burr removal from the heads of cap screws and bolts is specified for a high-speed trimming machine announced by the Federal Press Co., Elkhart, Ind. The No. 3 machine, with blanks capacities of $\frac{1}{2}$ to $2\frac{1}{2}$ in. long on all diameters $\frac{3}{8}$ in. and under, is pictured below.

The frame, flywheel and ram are built on lines of standard punch presses as contrasted with the horizontal type trimmer. The machine is inclinable at 35 deg. with main bearings for crankshaft and ram above the point of operation in order that the bearings may be away from the chip zone. The flywheel is mounted between friction disks provided with wedge take-up. The hopper feed is of paddle wheel

type, adjustable to size capacity-range of the machine.

The normal angular position of blanks in feeding is 35 deg. This position is maintained in transferring the blanks into the tools which permits transfer movement at high speed. The transfer mechanism consists of two levers operated by direct roller contact with cams, thus avoiding linkage. One lever operates the cradle for the blanks coming from the raceway; the other carries the pick-up fingers which bring the blanks into the tools.

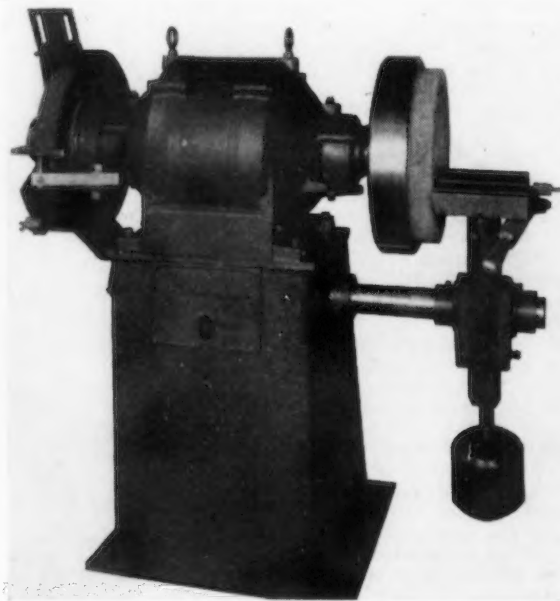
Taper gibs are used under the ram guides and provide that when the machine is adjusted for alignment of tools the bolts must be trimmed on center. This feature

of interchangeability of tools without dependence upon the operator for accuracy is stressed by the makers as of importance.

Ejection after trimming is accomplished with the movement of the ram on the up stroke; a bar extends through the bolster plate and carries an adjustable lug which acts directly on the knock-out pin.

A patented feature covers a device for severing or shearing chips from the screw or bolt head at the time that the punch and die have approached one another to crankshaft center position, with the chips pinched between the punch and die. With chips so held, pressure is brought to bear, on the end of the blank, in sufficient amount to accomplish complete chip removal. This design eliminates necessity for auxiliary lever movements for manual operation accomplishment.

COMPLETE chip removal is said to be attained through holding the chips in a pinched position and applying pressure to the screw or bolt.



Combination Grinders, Standard, Disk, Chuck—Either steel-wheel disk or ring-wheel chucks can be used at the right of the machine.

See page 40, column 2.

and Shop Equipment . . .



High-Speed Forging Presses Have Quick-Action Air-Clutch Feature

AJAX MFG. CO., Cleveland, announce a line of "Solid Frame" forging presses ranging in capacities from 500 tons to 1800 tons. These are fast-operating presses designed for accurate hot forging and precision hot or cold coining of forgings and pieces produced by other methods.

The presses are air-clutch controlled by the maker's multiple disk friction clutch, in the operation of which a piston carried within the flywheel applies pressure directly to the friction plates and gives instantaneous and cushioned response to tripping. This is accomplished by either a small auxiliary foot or hand-operated air valve as preferred. By regu-

lating the air pressure at the clutch to an indicated reading considerably below the shop line pressure through a suitable valve, the operating torque capacity of the clutch can be definitely set to just above that required for the work in hand, thereby providing effective safety for both the press and the dies. The quick engagement feature provided by this clutch design is said to permit operation at high production speed.

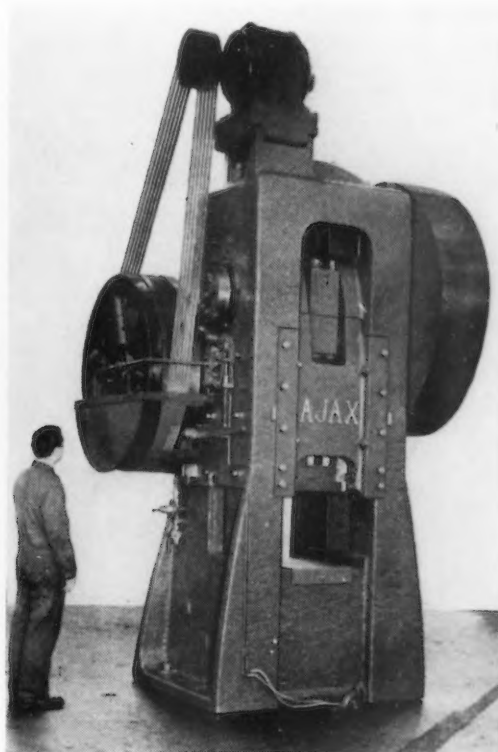
The frame, at right, is a solid one-piece steel casting, short from crankshaft to die seat, and of heavy cross-section for extreme rigidity and for the elimination of possible tie-rod uncertainties. This rigidity between main bearings

and die seat is said to improve the uniformity of the work produced, and to increase die life through shortening the time the dies are in contact with the metal by the period which would ordinarily go into stretching the frame and deflecting and compressing the working parts.

The main shaft is of the full eccentric type and made from heat-treated, steel forging. It is supported in the crown-rib bridged housings of the main frame. The bearings themselves are of an adjustable split-sleeve type with shimming at the part-line and a wedge beneath for adjustment of running fit.

The main eccentric shaft gear is of built-up welded steel construction with a high carbon rim where the teeth are cut. The 1800-ton size has two-stage gearing.

The ram derives improved alinement from a top extension



THE adjustability of air-clutch pressures to meet the requirements of work at hand affords protection to equipment while air valve tripping by either hand or foot provides convenience and quick action.



bearing at the rear side of the frame crown rib. This construction gives guide length without increased length of frame in tension, or length of pitman and slide in compression. It is designed particularly to withstand loads off the center-line, sometimes required for economical production of forgings. The slide is guided, front-to-back, against off-center loads and pitman angularity, from tongues at the rear which are never subjected to line contact by bow in the cover-plate, and can be close fitted despite the expansion of the ram from hot-work. A wedge side-guide provides for maintaining accurate side alignment with minimum running clearance.

The pitman is cut from special analysis rolled steel plate, heat treated, and its main bearing is readily accessible for assembly, inspection and adjustment. The wristpin bearing is supplemented by a thrust shoe bearing for its outside surface. This bearing is carefully sealed, individually lubricated and drained for protection against foreign matter.

A wedge in the bottom die seat provides for fine die adjustments without shimming, and is installed in such a manner as to be readily adjusted without unnecessarily interfering with the removal of forgings. Slide wedges and front-to-back poppets facilitate shifting of the bottom die in either direction to secure proper match with the top impressions. A central knockout in the ram is mechanically operated, as is also a multiple knockout in the die seat, which has nine stations located for ejecting difficult pieces from dies with progressive impressions.

Individual motor drive is through multiple V-belts from a motor mounted on an adjustable hinged bracket at the top of the frame. A hand-brake is provided to stop flywheel coasting after power has been shut off.

All size machines are equipped with an automatic, central lubricating system having hand auxiliary means by which lubrication of all bearings is assured prior to press operation.

Stokers.—Link-Belt Co., 2410 West Eighteenth Street, Chicago. Folder No. 1459, illustrated, entitled "Steam Costs Go Down When You Install Link-Belt Automatic Coal Firing," and folder No. 1458, illustrated, entitled "The Heating Plant Pays a Profit When You Install Link-Belt Automatic Coal Firing," contain data on underfeed screw-type stokers in sizes up to 300 Bhp.

Combination Grinders, Standard, Disk, Chuck

A COMBINATION disk and standard grinder is announced by the Production Equipment Co., Cleveland. The machine is pictured on page 38.

The right side is for disk grinding with either steel wheel disk or ring wheel chucks. Plain or universal lever feed table can be supplied with rocker arm and balancing weight.

The left side of the machine is arranged for standard grinding and is equipped with safety type welded steel guard having exhaust connection and hinged end cover. Standard motors $\frac{1}{2}$ to 10 hp. are employed for disks 7 to 20-in. diameter. Push-button control is provided.

Thread Timing Device for Staybolt Production

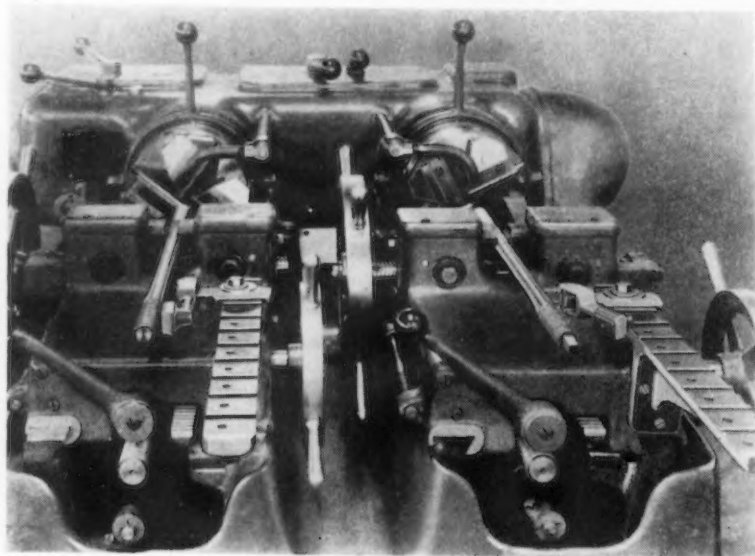
A TIMING attachment for threading reduced body staybolts with a continuous pitch thread on both sides is announced by the Landis Machine Co., Waynesboro, Pa. The equipment, shown below, is for use with threading machines manufactured by this company.

The timing attachment consists of a bracket attached to the carriage end cover. This bracket is

provided with positions for locating the gage bracket as may be required for various lengths of staybolts. The arm is attached to the gage bracket and carries the gage for timing the thread. All plain radial staybolts are threaded with a 12-pitch thread and the gage is made to fit. The gage arm being pivoted in the gage bracket permits it to be moved readily for clearing or engaging the thread. The attachment illustrated on the right-hand side of the cut shows the gage swung back to permit removal or insertion of the staybolt in the vise, while the one on the left shows the gage about to be engaged in the thread.

The operating procedure is to thread one end of the staybolt in the usual manner on one side of the machine without the use of the timing attachment. The set-up for the other end is made with a master staybolt which has been properly threaded with a continuous pitch thread on both ends. The master staybolt is inserted in the die head and the chasers closed to properly engage the thread. The timing attachment gage bracket is attached in its proper position for the length of the staybolt and the carriage set so that the timing attachment gage will properly engage the thread on the back end of the master staybolt. The lead-screw gears are then disconnected and the leadscrew turned by hand until it engages the leadscrew nut, after which the leadscrew gears are again connected.

Since a six-pitch leadscrew is



STAYBOLT is threaded at one side of the machine in the usual manner. The other side is set up with a master staybolt and the timing attachment.

used on the Landmaco threading machine and the staybolts are always threaded with a 12-pitch thread the leadscrew nut on succeeding threads can be engaged at any point on the screw and provide a proper lead. After the original set-up has been made a thread of continuous lead on both ends of the staybolt is assured.

The timing attachment gage is made in the form of an insert held in the gage arm. This permits making lateral adjustment of the gage if desired, and also allows the use of various gages of different thread forms.

New Resistor Element Increases Firing Heats

PRESENTATION is made to the metal-working and ceramic firing fields of a new line of high temperature furnaces operating up to 2300 deg. F., through the use of a new metallic resistor element of domestic make. The line is manufactured by Hevi Duty Electric Co., Milwaukee. The metallic resistor element can be operated in either oxidizing or reducing atmospheres. A high temperature, box-furnace model with atmospheric

control is pictured below. It is said that in the new design radiant plate and tee support construction, full support is given the various strands of wire and a free release of heat is assured, thus eliminating restrictions which have prevailed in furnace applications of resistor alloys in the nickel-chromium series.

Break-down tests with furnaces in actual operation are said to indicate an element life at 2300 deg. F., comparable to normal expectancy of nickel-chromium operating at 1850 deg. F. The new wire has a resistance greater than nickel-chromium and a higher current carrying capacity which makes possible ample kilowatt capacity to handle the temperature requirements. No water cooling of the element terminals is required. The element can be readily welded.

The illustrated furnace is equipped with the Hayes "gas curtain" atmosphere control feature for providing either oxidizing or reducing atmospheres for the charge being treated. The protective atmosphere for the charge can be introduced direct into the furnace chamber without deteriorating the element.

The installed capacity is 21 kw. for operation on 230 volts. The furnace will heat from room tem-

perature to 2300 deg. F. in 1 hr. 35 min., and has a radiation loss when saturated at 2300 deg. F. or 5.5 kwhr. per hr. After an overnight shutdown of 15 hr. the furnace drops to approximately 1000 deg. F. and will reheat to 2300 deg. F. in 55 min.

The heating element design is adaptable to many kinds of furnace types to suit various process requirements. Principally among these are the forging of steel, reheating billets, brazing, annealing of stainless steel and ceramic firing.

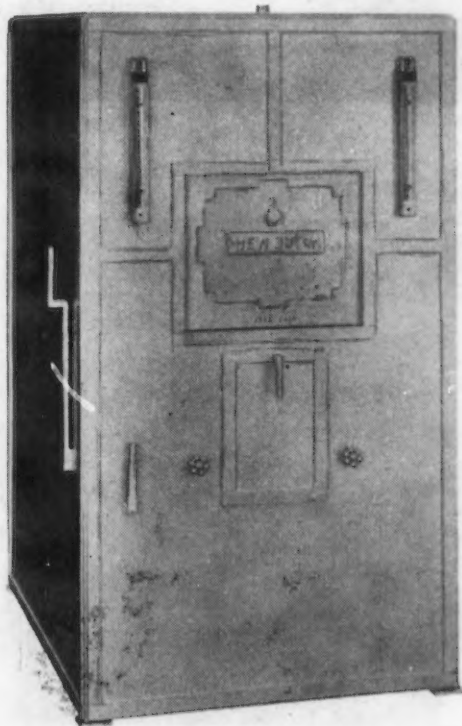
Standard Control Unit For Machine Tools

A STANDARDIZED, panel enclosed, electric-hydraulic control unit for machine tools has recently been placed on the market by Vickers, Inc., Detroit.

Various machine unit movements are electrically controlled from the panel illustrated below. Control is by push buttons or limit switches which with relays and solenoids are built into the panel.

Delayed reverse is provided by a synchronous time relay which is varied by a dial. Feed rates and rapid traverses are controlled hydraulically, being increased or decreased by table stops which depress one or the other of two center plungers. Stroke lengths are regulated by dog positioning. Manual control for set-up purposes is by hand lever.

Panel is flush mounted and requires no pipe connections.



AT LEFT

A NEW metallic resistor element of domestic make is reported to be an important factor in providing increased heat capacity.

See column 1.

o o o

AT RIGHT

THIS standardization of control includes the various production movements common to the units of modern machine tools.

See column 3



Projection Welder Has Capacity of 21 Spots

ILLUSTRATED below is a projection welder, 600-kva. capacity and weighing in excess of 14,000 lb. The base is 52 by 52 in. The machine height is 88 in. In range, the equipment covers simultaneous welding of 21 spots, distributed over a space 36 in. in length, at a rate of 1200 complete welds per min.

The equipment is a product of the American Electric Fusion Corp., Chicago and illustrates, in design, some of the possibilities in fabricating the main frame work, component parts and housing members from steel plate by arc welding process.

Vertical Arc Welder For Light Gage Metals

HARNISCHFEGER CORPN., Milwaukee, is marketing the new 50-amp., vertical low current arc welder illustrated in column 3. An outstanding feature is said to be an extremely stable high-speed arc permitting quick welding down

to No. 26 gage steels. No external reactors or separate stabilizers are used.

The self-stabilized arc is said to be achieved through the use of a special internal stabilizer winding. The motor generator unit, with a 3-hp. squirrel cage motor, operates on any alternating current power line including 110-volt single phase. Current control is by a single adjustment dial at the top of the housing. The equipment is suited to general repair work in lighter gage metals. The welder requires less than 2 ft. of floor space and is 36 in. high. The mounting may be either stationary or portable.

Built-Up Shoes and Punch Holders

A STANDARD line of all-steel shoes and punch holders is now manufactured by Danly Machine Specialties, Inc., Chicago. Torch cut and weld methods are utilized in cutting, recessing and building up of sections.

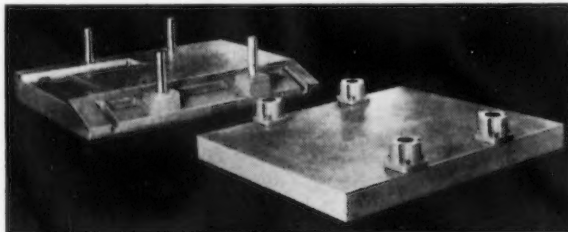
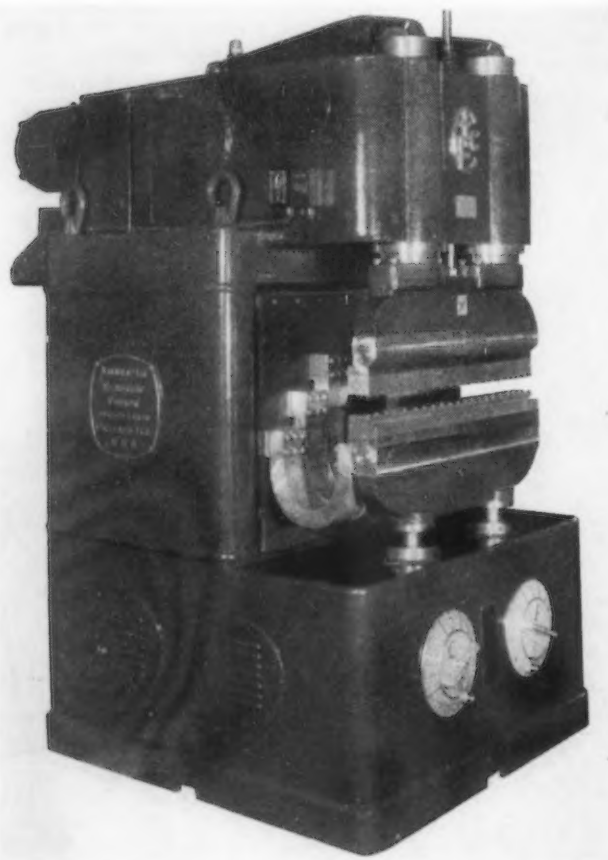
Eight types are manufactured in a series of standard sizes covering a wide spread of dimensions. Special sizes or shapes can be quickly

made by this same method from plate stocks carried in thicknesses from 1 in. to 6½ in.

The steel standard die sets include: round die sets, back posts diameters 6 to 20 in.; round die sets, center post diameters 10 to 24 in.; rectangular die sets, back post 6 in. x 12 in. to 20 in. x 35 in.; rectangular die sets, diagonal post 6 in. x 8 in. to 20 in. x 35 in.; rectangular die sets, center post 10 in. x 12 in. to 28 in. x 28 in.; rectangular die sets, center post 10 in. x 30 in. to 40 in. x 100 in.; four post die sets, 10 in. x 12 in. to 28 in. x 28 in.; and four post die sets, 10 in. x 30 in. to 40 in. x 100 in.

In the demountable boss set the boss replaces the usual bushing, and is regularly held to the shoe or punch holder by four socket head cap screws. The bosses are readily removable, thereby also releasing the pins, making the complete surface of the shoe or holder, or the die or punch mounted in them readily available for any type of work. These sets are also useful when more than one die is mounted in the set, as ready removal of bosses and pins provides easy die change.

Demountable boss sets are made in both two and four-pin series.



See column 2.

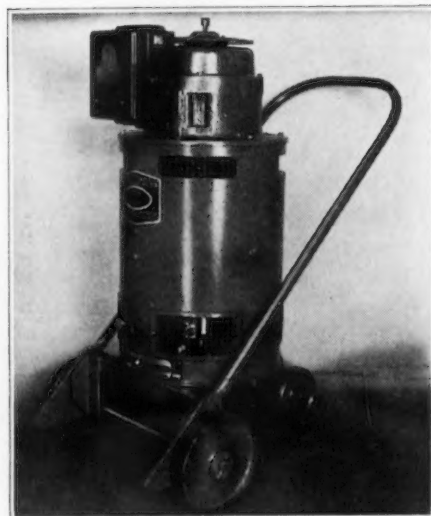
AT LEFT
Projection welder has capacity of 21 spots—At simultaneous welding.

See column 1 at top.

o o o

AT RIGHT
Vertical arc welder for light gage metals—Current control is by single dial.

See column 1.





Malleable Iron— Its Properties And Applications*

By D. P. FORBES

President, Gunite Foundries Corp.,
Rockford, Ill.

MALLEABLE iron must be regarded as a working material; in other words, it is more usually a component of machines than it is of static structures. It has to have strength to withstand strains, and toughness to withstand abuse.

College text books on metallurgy usually mention malleable iron in a vague sort of way as illustrative of the reactions of the decomposition of iron carbide by heat treatment. And photomicrographs are usually employed to show the formation of temper carbon. Little, if any, emphasis is laid on the merits of the material so obtained.

*Presented at joint meeting of Western Society of Engineers, Chicago Section A.F.A. and Chicago Section A.S.M.E. at Chicago, March 18.

Text books on mechanical engineering mention malleable iron as one of the materials of construction and occasionally give some of the physical properties, along with those of cast iron, wrought iron, steel, and other materials. In general, handbooks which are used in drafting rooms and engineering offices give physical properties for malleable iron of pre-war vintage. As a result, malleable is usually overlooked for many applications where it is the most logical material to use.

Many otherwise well-informed engineers have a surprising number of misconceptions concerning malleable iron, of which the following are most prevalent: That malleable iron is gray iron which has been annealed so that it will bend; that the strength of malleable iron lies in the skin, and that if this skin is removed the casting becomes very weak; that malleable iron of more than $\frac{1}{2}$ -in. section cannot be annealed; and that

if malleable iron is galvanized it loses its strength.

Prior to discussing the correct properties of this material, it might be well to review briefly how malleable iron is made. The usual commercial analysis has a carbon content slightly under 2.50 per cent and a silicon content slightly under 1.00 per cent, with other impurities such as manganese, sulphur, and phosphorus, within certain definite limitations. This material is poured into sand molds and solidifies as white cast iron castings. White iron is very hard and brittle and finds some commercial application parts subject to wear, such as sand blast nozzles, cleaning stars and ball mill balls. White iron castings which are to be malleableized are heat treated or annealed in large ovens, usually being packed in containers with a sand or slag packing material, whose principal purpose is to prevent warping of the castings. In the past decade an oxidizing pack-

ing has been used, for the purpose of reducing the carbon content of the castings. This practice has been almost completely abandoned.

Heat Treatment Improved

The heat treatment consists of holding the castings at a temperature of 1600 deg. F. or more for a sufficiently long period to break down the iron carbide into two constituents; temper carbon nodules and a solid solution of iron carbide in iron. The castings are then cooled in such a way that the carbide is precipitated out of the solid solution as additional temper carbon, leaving an ultimate structure of soft iron and uniformly distributed nodules of temper carbon.

As the metallurgy of this reaction has become more widely known, malleable foundries have taken advantage of the most desirable heat treating temperatures and as a result have succeeded in materially shortening the time required for annealing. Previously, this time averaged about seven days. A considerable tonnage of malleable iron now is made with a total time in the oven of three days, and this malleable iron is of the highest quality. The shortened anneal is possible only if extremely accurate temperature control can be maintained. This treatment is extremely difficult in large ovens or with antiquated equipment.

Consider now what the castings are like when they reach the purchaser's hands. The metal itself will have a tensile strength ranging from 50,000 lb. per sq. in. for high-carbon iron to 60,000 lb. per sq. in. for low-carbon iron, the increased strength apparently being due to the smaller percentage of temper carbon nodules which contribute nothing to the tensile properties. It is surprising that malleable iron test bars with a rough sand cast outside surface will show unusual uniformity. The maximum variation from a 55,000 lb. per sq. in. tensile strength average is rarely more than $\pm 3,000$ or 4,000 lb. per sq. in. This means that malleable iron is uniform and dependable.

Malleable iron is unusual in that the yield point is a very high percentage of the ultimate strength. For example, a malleable with 55,000 lb. per sq. in. ultimate strength will have a yield point of about 37,000 lb. per sq. in., or 67 per cent. This high yield point means a good ductility.

Most malleable produced today is tough and ductile. The elongation of a $\frac{5}{8}$ -in. diameter test bar

in a 2-in. gage length is above 15 per cent. Producers of low-carbon malleable have no difficulty in averaging as high as 25 per cent. It can be seen from this that malleable with a high yield point and a good ductility is at least comparable from a strength standpoint with low-carbon cast steel and soft forgings.

Malleable iron has a number of fields of usefulness where it is firmly entrenched. This entrenchment comes from the fact that a product will be consistently purchased only if it fills the necessary requirements at the lowest cost. It is useless for an industry to try to sell a product for an application where some other material is more economical.

This can be illustrated by the use of malleable iron in the automotive industry. As an example, consider the front hub of a passenger car. This is almost universally produced of malleable iron. It could be made as an upset forging or as a steel casting, or as an assembly of two rather simple stampings. These other materials have all been used, but what property has malleable iron that makes it particularly suited for such an application?

In the first place, the yield point of malleable is sufficiently close to that of forgings, steel castings, and stampings, so that from a static strength standpoint the other materials offer no particular advantages. The ductility of malleable being over 15 per cent in most cases, it is adequate to provide sufficient toughness to withstand blows and road shocks, without sudden failure.

From a cost standpoint the malleable casting is probably slightly cheaper than the steel casting and the forging. From the standpoint of adaptability to design, malleable iron is probably somewhat more flexible than the other materials. The stamping would have the disadvantage of requiring assembly and also would necessitate uniform sections at all points. The



big saving to the manufacturer, however, is in the cost of machining. Malleable iron can be machined at higher rates of speed than any other ferrous metal, with the possible exception of fully annealed cast iron. There is a saving not only in the cost of machining each individual hub but also fewer machine tools are required to maintain a definite production. As a result, a malleable iron hub is the cheapest hub which will fill the engineering requirements of such a part.

Other applications of malleable on automotive vehicles are pedals, spring brackets, differential carriers and cases, various brake parts, and numerous brackets, levers, and supports throughout the chassis and motor. Automotive engineers are thoroughly conversant with the properties, limitations, and design of malleable castings, and the use of malleable on automobiles has expanded steadily in the past few years. This greater use has been in spite of the competitive pressure of stampings, forgings, and die castings.

Has Corrosion Resistance

Malleable iron finds many uses in the railroad field. Here, the machinability of malleable is of practically no consequence. What is wanted is a low cost, strong, tough material. For many light parts, of which box car door fittings are typical examples, production quantities are usually so small that forgings are at a cost disadvantage because of cost of dies, and steel castings are at a cost disadvantage because of difficulty of casting light sections. Malleable is suited ideally for this purpose. On heavier castings, such as running gear parts, malleable iron is in most cases an optional material with cast steel and whichever material has the lowest market price at the time is usually selected for the parts. Uses for malleable castings in the railroad field include side bearings, journal boxes, center plates, brake heads, column guides, brake beam brackets, draft gear parts, draft lugs, and coupler carriers.

Malleable iron is used extensively in railroad work because of its excellent corrosion resistance. In this respect, it appears to be decidedly better than stampings or forgings and under certain conditions it is superior to steel castings. This is due to the graphite content in the malleable iron which tends to inhibit the penetration of rust.

In the agricultural field, malleable iron is used extensively to withstand the rough usage usually given to agricultural implements.

Most operating parts are not machined and smooth surfaces are necessary. The metal must be tough to withstand shocks encountered in service and the metal must be rust resisting to withstand the exposure to which nearly all agricultural implements are subjected. Agricultural machinery companies have literally thousands of patterns and while many parts are now made of forgings, the investment in dies would be prohibitive from the manufacturers' standpoint.

Of more interest in many cases are the miscellaneous applications, such for example as lawn mower gears, washing machine parts, hardware items, conveyor chain, tool parts, pipe fittings, bolt anchors for cement construction, railing panels for bridges, industrial fence fittings, manhole covers, small machine tool parts, barrel plugs, electrical outlet boxes, cable clamps, insulator supports, school desk frames, packing house machinery, sewing machine parts, and literally thousands of other applications too numerous to mention.

In many of the above applications, the sole reason for the use of malleable iron is that it is not easily broken when subjected to an unusual strain. In many places cast iron would be adequate from a strength standpoint but might snap off if abused from some outside source.

In the past 50 years, before laboratories were common and before the metallurgy of graphitization was widely understood, a large amount of inferior malleable iron was produced which definitely hurt the industry. Just as the steel casting, if improperly made, may contain defects, and the forging may contain cold shuts or burned metal, so also may the malleable casting contain shrinks and primary graphite.

If the white iron, of which malleable is made, contains any graphite before the anneal, it will be weak and poorly ductile after the anneal, particularly in the heavy sections. Many tons of such iron have been shipped to customers in the past; this resulted in malleable iron receiving a black eye, particularly in heavy weight castings. It has been a difficult process of education to convince purchasers that this remedy has been corrected and that malleable iron is entirely reliable in castings of moderately heavy sections, if made of the correct analysis.

Foundry technique has also advanced greatly in the elimination of shrinks and porous sections in the castings. In the old days, it was the custom to eliminate shrinks in vital places by the use

of chills, which served to drive the shrink to a less important spot in the casting. This practice has been changed radically over the last 10-year period, so that now shrinks are eliminated by suitably situated feeder heads, which supply molten metal to the casting as it solidifies. The proper location of gates and feeders is a science in itself and malleable foundry foremen have become very proficient in gating castings correctly. It is relatively simple for a foundryman to break up white iron castings, due to their brittleness, and inspect each sample for defects before the patterns are started in production in the foundry.

Deserves Higher Specifications

Improvement made in the elimination of shrinks and primary graphite in the last 10 years has been of much benefit in expanding the market for malleable. For there has been a steady improvement in tensile strength and elongation, which has resulted from submission of test bars to a central laboratory for certification. It is interesting to note in this connection that the malleable industry over at least the last 20-year period has constantly asked the American Society for Testing Materials for an increase in the standard physical specifications.

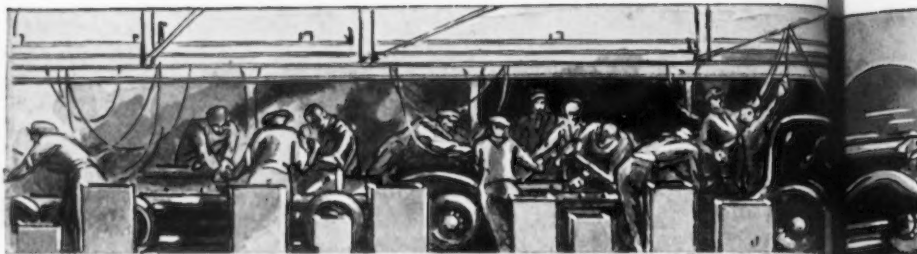
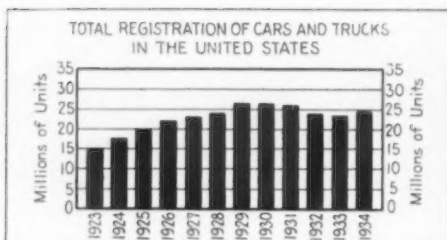
Advancements in metallurgy have disclosed that the same process which forms malleable iron will form other valuable products if the method of manufacture is varied. One hundred years ago wrought iron was universally used for structures requiring high

strength, because steel was not commercially available. Steel contains appreciable percentages of combined carbon, where wrought iron does not, and is, therefore, much stronger. In a similar way, products have appeared which are similar to malleable iron, except that they contain up to 0.80 per cent of combined carbon, as against malleable iron, which contains practically none. The utility of these products is great since care in manufacture will develop high tensile strength with reasonable ductility. A typical example of such a material would have a tensile strength of 90,000 lb. per sq. in., a yield point of 70,000 lb. per sq. in., and an elongation of 16 per cent in 2 in. Another type might have a tensile strength of 70,000 lb. per sq. in., a yield point of 50,000 lb. per sq. in., and an elongation of 16 per cent. The field of usefulness for such metals has not yet been adequately explored, but it is probable they will invade the present field of forgings, steel castings, and malleable iron. The handicap at the present time is the necessity for expensive equipment for the accurate heat treatment required to obtain uniformity.

These metals cannot be properly classed as malleable iron and as yet no standard has been set up by any of the engineering societies covering physical properties, although steps have already been taken not only to find a name which covers the various materials in this group but also to investigate the practicability of tentative specifications covering such products.

SERGEANT of Field Artillery, Illinois National Guard, demonstrates the possibility of the new "turret top" auto body as a machine gun mount. Ex-dough boys might suggest a super turret to protect the gunner.





THIS WEEK ON THE

April, Estimated at 440,000 Units, Likely to Be Peak Month

DETROIT, April 2.

WHAT little pessimism the automobile industry has had this year has been wrapped up in moth balls and stored away for the present. Paeans in praise of the sales outlook are being chanted by car manufacturers as they go into their most active season. If sales executives were assailed by doubts in the last month, they have cast them aside and can see nothing in the way of building up a fat volume in April and May. Those who expected the top sales cream to be skimmed off the market by this time have happily found the cream to be much thicker than they had anticipated.

First quarter sales figures prove that the country has been spending its money for new cars. Domestic registrations of passenger cars and trucks in January totaled 171,394 units. February is estimated at 217,000 and March at 280,000. This makes the volume for the quarter over 668,000 units, or 63 per cent more than in the same quarter a year ago. One must go back to 1930 to find a better first quarter, sales then having amounted to 794,878 units.

Although sales have been relatively high, they are still climbing. Chrysler Corp. is making retail deliveries of about 16,000 cars a week, an all-time record. Pontiac dealers sold over 16,000 cars in March and the factory is anticipating an April which will top all previous marks. Ford continues to lag in deliveries of certain models, despite a production rate which is taxing the capacity of the Rouge plant. Chevrolet sales should leap forward this month, now that dealers are being furnished 5000 cars

and trucks a day. Then there will be the General Motors shows starting next Saturday and special sales drives by other car manufacturers to stimulate retail demand.

April Output to Be 440,000 Units

The picture takes on an even rosier hue when one looks at it from a production angle. First quarter assemblies are estimated to have been at least 1,077,040 cars, the best initial quarter of the year since 1929. Output in the same quarter in 1930 was 1,046,689 units. April will show a gain over March largely through increases scheduled by General Motors and Ford. The total should be 440,000 units. May appears good for 400,000 units and June for a minimum of 325,000 units.

Unless the trend should sharply veer away from the direction in which it is now pointing, second quarter production should be 1,165,000 units, or slightly larger than output in the first quarter. Assemblies in the first half of 1935 then would amount to almost 2,250,000 units, an increase of about 25 per cent over the first six months of last year.

For the last half of the year it is conceivable that the inauguration of the fall model program will help pump strength into production activities during their weakest season. Manufacturers will want to make current models just as long as they can sell them in good volume, yet are faced by the necessity of publicly presenting 1936 lines before Nov. 30. The lull between models, hence, is likely to be shorter than usual this year. This fact will prove an aid to the

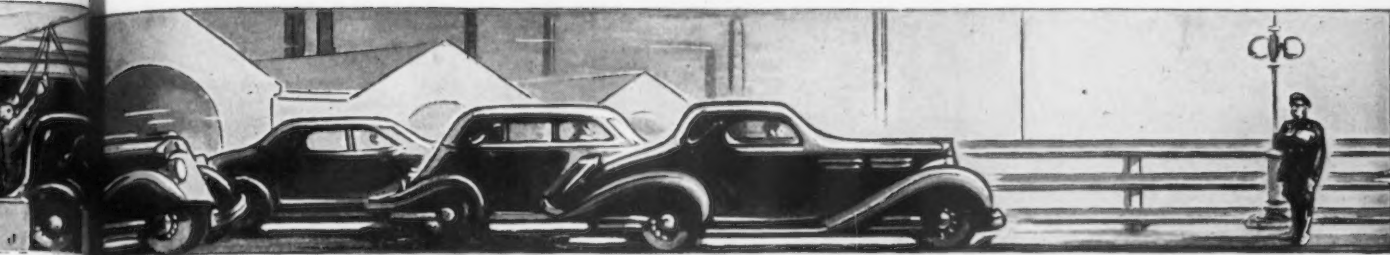
steel industry, parts makers and a score of other industries catering to the motor car trade.

Ford Spends \$4,000,000 for Machine Tools

While there has been no fanfare of publicity as yet regarding its plans, it is an open secret that the Ford Motor Co. is engaged in the task of tooling up the Rouge plant with new equipment so that it can build 6000 units in a 16-hr. day. It will be remembered that Ford began a comprehensive tool buying program last November to expand production facilities for the manufacture of 5000 units in 16 hr. The success with which Ford has met this year apparently is responsible for the decision to enlarge this program. It earlier was estimated that Ford would spend \$2,500,000 for machine tools and other machinery in connection with the increase in manufacturing capacity, but the fact is well established that at least \$4,000,000 already has been spent and the end of equipment purchases is not yet in sight.

Ford has announced that it intends to make 165,000 units this month. Production at Dearborn currently is around 6400 units a day, six days a week, with pressure being exerted to get the daily total up to 7000 units. Ford will be in the market for its May steel requirements in the next 10 days. Its purchases for next month are expected to be larger than those for April.

Speculation as to what Ford will do with its steel plant after the new sheet mills are completed has not yet hit on the correct answer. Ford's steel finishing capacity, of



ASSEMBLY LINE

course, considerably exceeds its raw steel capacity. It has been suggested that Ford will favor the new sheet mill as against the bar mill, buying fewer sheets and more bars outside. Then, again, it has been asserted that semi-finished steel will be purchased in the open market in order to keep both the bar and sheet mills operating on good schedules.

Ford to Keep Steel "On the Spot"

It can be authoritatively stated that Ford's policy will be governed by variable factors which will make it desirable to shift emphasis from time to time. When bars are cheap in Ford's eyes, Dearborn will buy bars in the commercial market and make sheets on its own mills. If it becomes profitable to run the bar mill and buy a large percentage of sheets outside, such action will be taken. On the other hand, it may be advantageous, depending on the market price of steel, to buy semi-finished steel and push both the bar and sheet mills. All of which gets down to the point that Ford intends to keep the steel industry on the spot, if possible. It will constantly dangle in front of steel makers' eyes the possibility that steel will be bought from them, rather than rolled at Rouge, if the price is "right." It's an old Ford custom, which has stood up through the years and which is just as good today in its effect as it was five years ago.

Chevrolet has placed large steel releases the past week, and other General Motors units should be good steel customers in the next two weeks. A few temporary hold-ups of steel deliveries were asked by Fisher Body, particularly for its Cleveland plant, because of congestion in handling materials. Chrysler is the least productive of the Big Three in steel tonnage.

Chevrolet is said to have 125,000 cars and trucks projected for April and 120,000 for May. It will formally dedicate its new branch as-

By BURNHAM FINNEY

Detroit Editor, THE IRON AGE

o o o

sembly plant at Baltimore on April 9. Its sudden boost in truck assemblies still is causing excitement among suppliers, who are being pressed for deliveries of parts. Pontiac and Oldsmobile have operations near full capacity, turning out about 18,500 and 16,000 cars a month respectively. No change in their schedules is anticipated for April. Buick officials are feeling good over sales of about 5500 cars in March and a production rate of around 7000 cars in April.

Plymouth Building 1800 Cars Daily

Plymouth is building 1800 cars a day, five days a week, and its retail sales are almost abreast of production. Dodge is above 1000 passenger cars a day; it is continuing to manufacture 300 trucks daily. Chrysler and De Soto output is being regulated closely to conform to retail sales. Chrysler retail deliveries are averaging 900 to 1000 cars a week. From Jan. 1 to March 16 Chrysler dealers sold 6407 cars, compared with 1064 in the same period a year ago. Production of Chrysler-made cars in the second quarter, however, still promises to be less than in the first quarter, according to reliable reports.

Hudson was the center of excitement the past week when it was reported to have made application for an R.F.C. loan to finance increased production. It is understood to have taken this step merely to borrow money at a lower rate than could be obtained from its regular banking connections. Premature publicity as well as the policy of the R.F.C. apparently spoiled the plan. The R.F.C. is reluctant to loan money until after the usual banking sources have been tapped. Hence Hudson is said

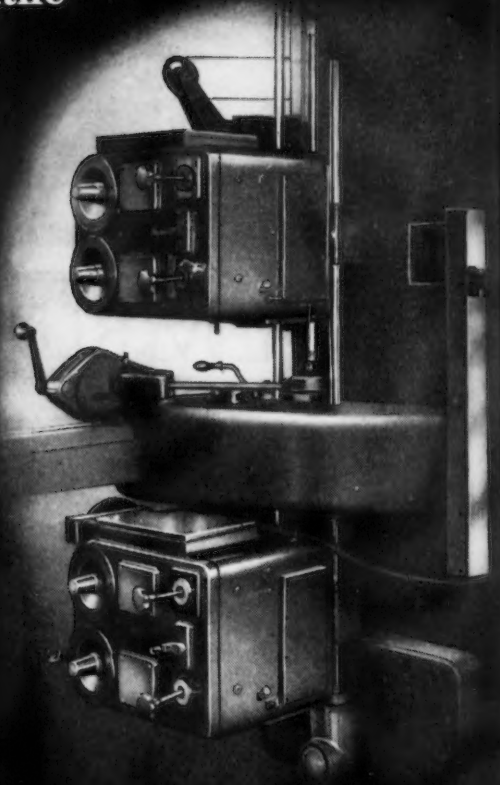
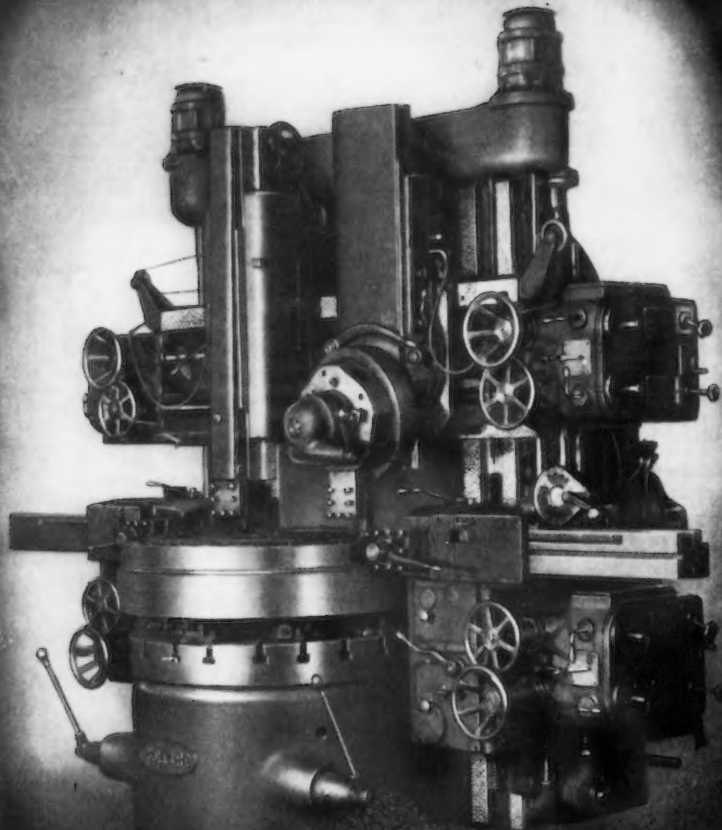
to be securing added cash from banks. Hudson built 7500 cars in February, around 10,000 in March and may get as high as 12,000 in April.

Another independent car maker, Hupmobile, created even more of a stir last week than Hudson. Hupmobile has been in more or less of a turmoil ever since Archie M. Andrews got enough proxies from stockholders last year to add to his own holdings so that he was able to wrest control of the management from Dubois Young. There have been three changes in management since Mr. Andrews gained ascendancy. The storm which has been swirling around Mr. Andrews' head finally broke on Friday when J. Walter Drake, former Hupmobile head, asked the local Federal court for an injunction, which was granted temporarily, to prevent directors supposedly allied with Mr. Andrews from carrying out certain contracts involving payment of commissions, and granting of stock options to him. The petition alleges that the company is solvent, but mistrust of the management has led suppliers (supposedly including Hayes Body Corp., which furnishes all of Hupp's bodies) to sell to it strictly on a C.O.D. basis. To add to its troubles, Hupp's directors were summoned by the New York Stock Exchange to explain why the company's stock should not be stricken from the list. Hupp has orders on hand for 3000 cars. If the present tangle can be unraveled, it may be able to snap out of a bad situation.

General Motors is believed almost certain to retain knee action wheels in 1936. Independent front wheel suspension will stay on next year's Buicks, first of the G.M. lines scheduled for introduction. It is likely to stay on other G.M. cars which now have it. Mr. Sloan said last week that "the corporation is convinced that the ultimate in a better ride can be obtained only by insuring independent action of each front wheel. . . . This costs somewhat more, but is well worth it."

Bullard Hydro-Shift

Vertical Turret Lathe



FOR THOSE HEAVIER JOBS

INCOMPARABLE design and Performance. Mass weight properly distributed provides for absorption of vibration, assurance of maintained alignment, and for ease of rail, side head, and slide movements.

Weight is necessary on those heavier cuts, and when properly distributed, becomes an asset in machine performance and results on finished work. Hydro-Shift Cross-Rail, Main Heads and Side Heads are perfectly counterweighted for ease of operation. Another illustration of the proper placing of weight is shown above. Hydro-Shift Side Heads are braced to the side of the bed by an arm cast integral with the Side Head Saddle. These are only two instances of the effective application of weight.

Machine weights: 46 in. — 56750 lbs. . . 56 in. — 63250 lbs. . .
66 in. — 69830 lbs. . . 76 in. — 77425 lbs. . . 86 in. — 87200 lbs.

THE BULLARD COMPANY

BRIDGEPORT

CONNECTICUT

Exports Continue to Decline as Imports Gain

Exports of Iron and Steel From the United States

	(In Gross Tons)		Two Months Ended February	
	February		February	
	1935	1934	1935	1934
Pig iron.....	284	326	545	652
Ferromanganese.....	6	6	3	6
Iron and steel scrap.....	151,720	75,884	331,350	163,156
Tin plate scrap.....	2,894	.....	7,103	.....
Waste-waste tin plate.....	1,718	.....	3,991	.....
Pig iron, ferroalloys and scrap.....	156,616	76,216	342,992	163,814
Ingots, blooms, billets, sheet bars.....	5,330	679	8,551	1,134
Skelp.....	1,171	817	1,544	1,636
Wire rods.....	1,681	1,190	4,960	8,201
Semi-finished steel.....	8,182	2,686	15,055	10,971
Steel bars.....	5,126	3,348	9,871	6,664
Alloy steel bars.....	281	163	435	551
Iron bars.....	34	58	267	170
Plates, iron and steel.....	4,011	3,004	6,030	5,491
Sheets, galvanized steel.....	6,178	4,263	11,502	9,079
Sheets, galvanized iron.....	56	81	155	188
Sheets, black steel.....	6,953	4,912	19,119	10,660
Sheets, black iron.....	468	157	869	299
Hoops, bands, strip steel.....	3,512	1,884	6,284	4,785
Tin plate and taggers tin.....	10,266	16,512	25,220	37,630
Terne plate (including long ternes).....	266	.....	548	.....
Structural shapes, plain material.....	2,210	1,505	3,873	2,648
Structural material, fabricated.....	2,126	1,464	3,837	3,548
Tanks, steel.....	501	1,648	1,275	2,128
Steel rails.....	1,189	11,111	2,189	23,378
Rail fastenings, switches, spikes, etc.....	694	2,715	1,409	6,547
Boiler tubes.....	320	554	1,152	1,052
Casing and oil line pipe.....	5,037	3,730	9,095	9,216
Pipe, black and galvanized, welded steel.....	3,135	2,773	7,330	6,429
Pipe, black and galvanized welded iron.....	328	223	472	367
Plain wire.....	1,892	3,374	5,112	6,892
Barbed wire and woven wire fencing.....	2,313	3,324	5,037	5,659
Wire cloth and screening.....	74	59	174	95
Wire rope.....	319	120	550	404
Wire nails.....	548	966	1,331	1,832
Other nails and tacks.....	305	375	654	683
Other wire and manufactures.....	306	313	671	783
Bolts, nuts, rivets and washers, except track.....	574	398	1,012	822
Other finished steel.....	125	90	197	269
Rolled and finished steel.....	59,147	69,124	125,670	148,569
Cast iron pipe and fittings.....	2,375	1,393	3,193	2,483
Malleable iron screwed fittings.....	184	238	453	573
Carwheels and axles.....	695	391	1,184	697
Iron castings.....	564	814	1,413	1,427
Steel castings.....	231	61	347	154
Forgings.....	543	261	970	519
Castings and forgings.....	4,592	3,158	7,560	5,853
Total.....	228,537	151,184	491,277	329,207

Imports of Iron and Steel Products Into the United States

	(In Gross Tons)		Two Months Ended February	
	February		February	
	1935	1934	1935	1934
Pig iron.....	10,741	10,777	12,774	22,663
Sponge iron.....	.....	28	257	73
Ferromanganese and spiegeleisen ¹	2,749	2,729	5,379	4,142
Ferrosilicon ²	88	17	301	18
Other ferroalloys ³.....	.....	.....	1	63
Scrap.....	2,790	4,343	5,205	5,503
Pig iron, ferroalloys and scrap.....	16,368	17,922	23,917	32,462
Steel ingots, blooms, etc.....	467	67	566	121
Wire rods.....	952	864	1,727	1,611
Semi-finished steel.....	1,419	931	2,293	1,732
Concrete reinforcement bars.....	.....	229	109	275
Hollow steel bars.....	55	48	105	109
Merchant steel bars.....	1,604	1,254	3,814	2,287
Iron slabs.....	.....	.....	1	1
Iron bars.....	119	26	177	72
Boiler and other plate.....	19	6	29	23
Sheets, skelp, and saw plate.....	546	348	867	836
Tin plate.....	10	2	14	5
Structural shapes.....	1,885	1,523	5,454	2,553
Rails and rail fastenings.....	407	186	618	376
Welded pipe.....	132	221	153	476
Other pipe.....	1,247	279	2,916	806
Barbed wire.....	2,217	347	3,901	1,896
Round iron and steel wire.....	224	147	639	405
Telegraph and telephone wire.....	.....	.....	1	1
Flat wire and strip steel.....	103	184	215	233
Wire rope and strand.....	113	103	306	248
Other wire.....	67	64	213	66
Cotton ties.....	12	.....	92	.....
Other hoops and bands.....	1,234	1,040	3,441	1,863
Nails, tacks, and staples.....	966	414	1,959	1,019
Bolts, nuts, and rivets.....	22	25	58	53
Horse and mule shoes.....	42	10	124	36
Rolled and finished steel.....	11,024	6,456	25,204	13,639
Malleable iron pipe fittings ⁴.....	.....	1	37	.....
Cast iron pipe and fittings.....	.....	.....	.....	2
Castings and forgings.....	94	97	238	224
Total.....	28,905	25,407	51,689	48,060

¹ Manganese content. ² Chrome content. ³ Silicon content. ⁴ Alloy content.
⁵ New class. No comparable figures for 1934 and previous years.

IRON and steel products shipped from the United States during February amounted to 228,537 gross tons and for the second consecutive month represented a decline, falling 13 per cent under the January figure. However, a gain of 51 per cent was registered over shipments made during the corresponding month of 1934. The outstanding features in the month's trade included a 17,910-ton drop in iron and steel scrap shipments; a 5,213-ton decline in black steel sheets, and substantial increases in shipments of several other products.

February imports aggregated 28,905 tons to advance 26.8 per cent over the January take, and 13.7 per cent above the trade during the corresponding month of 1934. The substantial 7,992-ton rise in pig iron receipts was outstanding, and marked the resumption of Netherlands participation in this trade after an absence of several months. Worthy of mention also was the 1,684-ton decline in structural shape imports.

February shipments showed decreases in 34 items when compared

Sources of American Imports of Iron and Manganese Ores

	(In Gross Tons)			
	February		Manganese Concentrates, 35 Per Cent or Over	
	Iron Ore		1935	1934
Canada.....	.....	428	.....	.....
Cuba.....	22,560	.....	2,115	.....
Chile.....	43,100	43,304	125	.....
Spain.....	6,962	.....	.....	.....
Norway.....	6,842	.....	.....	.....
Sweden.....	.....	.....	.....	.....
French Africa.....	.....	6,750	.....	.....
Russia.....	7,300	10,749	802	.....
India.....	.....	118	535	.....
Brazil.....	.....	.....	.....	.....
West Africa.....	.....	2,878	780	.....
Other countries.....	15,783	6,203	.....	.....
Total.....	95,187	63,985	15,985	2,117

*Australia.

United States Imports of Pig Iron by Countries of Origin

	(In Gross Tons)			
	February		Two Months Ended February	
	1935	1934	1935	1934
United Kingdom.....	.....	50	50	50
British India.....	2,745	4,753	2,745	8,903
Germany.....	6,759	5,001	6,759	11,682
Netherlands.....	892	716	1,821	1,771
Canada.....	.....	.....	.....	.....
France.....	345	.....	345	.....
Belgium.....	.....	.....	200	.....
Norway.....	.....	.....	.....	.....
Sweden.....	.....	.....	.....	.....
All others.....	257	854	257	.....
Total.....	10,741	10,777	12,774	22,663

with the January trade, with gains in 30. The most prominent loss was registered in exports of iron and steel scrap, which fell off by 17,910 tons, while black steel sheets recorded a decrease of 5,213 tons. Other decreases of importance were tin plate and taggers' tin, 3,688 tons; wire rods, 1,597 tons;

tin plate scrap, 1,315 tons; plain wire, 780 tons; and welded galvanized steel pipe, 592 tons. On the other side of the ledger, substantial gains were registered in shipments of ingots, blooms, billets, slabs, and sheet bars, 2,109 tons; "other plates," 1,864; galvanized steel sheets, 1,854 tons;

cast iron pressure pipe and fittings, 1,505 tons; seamless casing and oil-line pipe, 932 tons; skelp, iron or steel, 798 tons; and strip, hoop, band, and scroll, hot rolled, 744 tons.

Detailed export and import figures are shown in the accompanying tables.

Batch Mixer for Sand And Other Materials

ABILITY to thoroughly and rapidly mix foundry sand, abrasives, enamels, refractories, clays and other materials of dry or plastic constituency are among the advantages claimed for a batch mixing machine that is being manufactured by the C. O. Bartlett & Snow Co., Cleveland. The Lancaster mixer, as it is designated, has a revolving pan that carries the ingredients to the mixing area, where one or more assemblies of plows or plows and mullers whirling in counter direction produce a thorough and homogeneous mix.

From the mixing area the materials are passed outward and are then turned with side plows and scrapers and carried back into the mixing area by the revolving pan in a continuous cycle. Every portion of the batch is subjected to the action of the mixing units with every revolution of the pan. A batch may be thoroughly mixed, it is stated, in three to five minutes, this including the loading and discharging time.

Different assemblies of plows or plows and mullers may be used,

depending on the materials being handled and conditions to be met. The mullers used, principally when it is necessary to break up lumps or when it is desired to coat one material with another, "ride" on the material so as to impart a rolling rather than grinding action. Foundry sands, abrasives and silicates, it is stated, are mixed without impairing the crystalline structure of the granules.

The mixer is made in open and closed types, the former being particularly suited for mixing the heavier bulk materials, especially those containing considerable water or other liquid. Closed types, which are fitted with sealed rings to provide a dust-tight fit, are preferred for dry or semi-dry mixing.

The mixers may be loaded by hand from chutes or with an elevating hopper supplied as a part of the machine. Discharge is through a single port in the center of the pan. A power-driven discharge mechanism is provided for the larger sizes. Moving parts are carried in anti-friction bearings and power transmission equipment

is wholly inclosed. The mixer is made in seven standard sizes for 2/3 to 36 cu. ft. capacity.

Metal Trades Branch Holds Annual Meeting

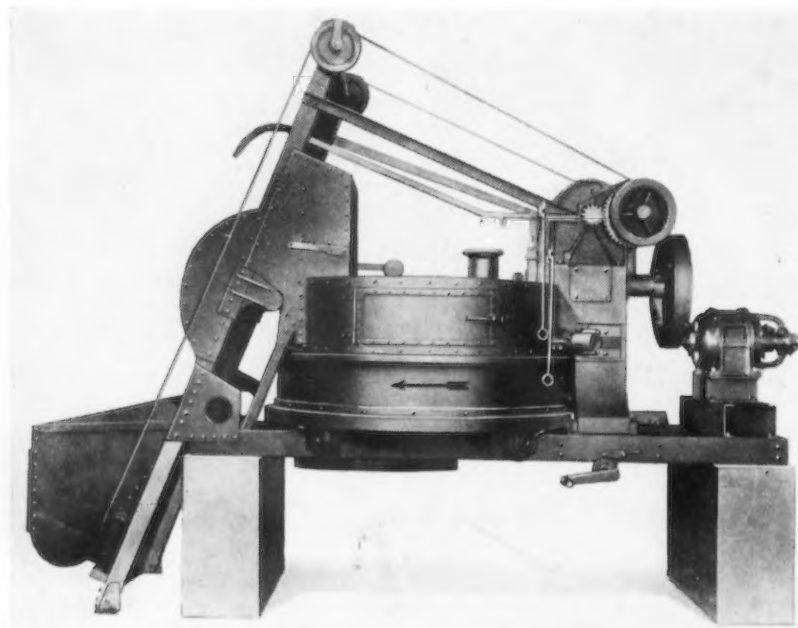
GOVERNMENT invasion of private business was attacked by John C. Gall, associate counsel, National Association of Manufacturers, and by Representative Charles A. Eaton of New Jersey, in addresses before the annual convention of the Chicago branch of the National Metal Trades Association at Chicago, March 28.

"Government competition is the most deadly and the most unfair competition private business encounters today," declared Mr. Gall.

"For the first time in the history of the American people," said Representative Eaton, "we have turned to the Government to do for us what hitherto we have always done gloriously for ourselves.

Newly elected officers of the Chicago branch are: President, Warren G. Jones, president, W. A. Jones Foundry & Machine Co.; vice-president, Ralph K. Norton, president, Acme Steel Co.; treasurer, Arthur E. Blackwood, Norton Lasier Co. Members of the executive committee elected for the new year include: Howard Goodman, secretary, Goodman Mfg. Co.; Alfred Kauffman, vice-president, Link-Belt Co.; J. S. Knowlson, president, Speedway Mfg. Co.; Frank McNellis, president, Imperial Brass Mfg. Co.; A. M. Sheldon, president, Union Special Machine Co., and C. A. Ziebarth, secretary, Bell & Howell Co.

Link-Belt Co., Chicago, has moved its Portland, Ore., warehouse away from the congested business district on Front Avenue, where it had been located for about 20 years, first in the name of Meese & Gottfried Co. and later as Link-Belt Co. The new warehouse, at the corner of Fourteenth Avenue and Savier Street, has 10,000 sq. ft. of floor space and is close to the freight sheds, the docks on the water front and the main highway along the Willamette River. A complete line of conveying and power transmitting machinery will be carried.



Flays Wagner Bill as Gross Extension of Government's Responsibility and Power

PROBABLY the most telling criticism and competent analysis of the proposed Wagner Labor Disputes Bill now before Congress was offered by Walter Lippmann, in his "Today and Tomorrow" column in the New York *Herald Tribune* on March 28. Coming from the pen of one of the world's foremost liberal political and economic commentators, Mr. Lippmann's words achieve added significance. His discussion, in part, follows:

Opponents of the Wagner labor bill have been saying that it would set up a "labor dictatorship," and Senator Wagner has declared that there is not a scintilla of truth in the charge. No one, I believe, will ever know which of these contentions is true. For if the bill were passed it could not be made to work, and instead of a labor dictatorship or the opposite it will simply produce interminable and inconclusive litigation and dispute.

In his explanatory statement accompanying the bill, Senator Wagner says that Section 7-A is being reduced "to a sham and a delusion," and that "everybody needs a law that is precise and certain." He is right on both counts. But if ever there was a law that is not precise and not certain it is his own bill.

The purpose of the bill is to use the power of the Federal Government to protect the right of wage earners to organize in order to bargain collectively. The first question that arises is: What wage earners are covered by the bill? The answer is important if we are to have a precise and certain law. Senator Wagner's answer to this vital question of jurisdiction is completely and absolutely vague. His bill proposes to draw the Federal Government into all labor disputes about the right to organize that are "affecting commerce." Here at the outset is the material for an endless series of lawsuits. It would take years for the Supreme Court to define the practical meaning of a phrase that is as broad and as woolly as Senator Wagner's.

The trouble is that Senator Wagner is trying to extend the Federal power over labor relations as widely as possible. It would have been more statesmanlike to have begun by limiting the Federal Government's responsibility to the cases it might hope to deal with effectively. Senator Wagner may think he has hit upon a device for stretching the Constitution. But what he has

really done is to impose upon the Government a responsibility it cannot possibly meet. His bill leads labor to think that the Federal power protects unionization in every town and in every industry in the United States. But the fact is that if the courts do not deny this power the sheer difficulties of administration will nullify it. Thus in one way or the other we shall have another sham and delusion.

Having embraced all commerce vaguely, the bill then defines the "rights of employees" which are to be enforced by civil and criminal sanctions. These rights are also magnificently not precise and not certain. An employer may not "interfere" or "restrain" or "coerce" or "dominate" or "encourage" or "discourage" the organization of wage earners. A board of three men in Washington is intrusted with the simple task of deciding whether an employer in San Francisco discouraged John Smith from joining the A, B, C union and encouraged him to join the X, Y, Z. It is preposterous to put such a burden upon mortal men, and it is in the last degree foolish to lead labor to think that the Federal Government is as omnipotent and as omniscient as this bill requires it to be.

The trouble here is that Senator Wagner is trying to use the cumbersome process of litigation to enforce vague "rights" when there is a much simpler way of protecting the rights he is trying to protect. This is the method of elections conducted by the Federal Government. . . .

It is true that in Section 9 Senator Wagner provides for elections. But this section, which ought to be his main reliance and the most carefully worked out part of the bill, is vitiated at the start by a complete misapprehension. It declares that "representatives" chosen by the majority of the employees in a unit shall be the exclusive representatives of all employees in such a unit "though individuals or minorities may present grievances."

The trouble with this is that it assumes that elections will show a clear majority of all the employees. That is a mistaken assumption. If the Senator will reread the famous decision of the National Labor Relations Board in the Houde case he will see that this very decision upholding the majority principle clearly recognizes that it applies only when there is in fact a majority. "Nor does this opinion lay down a rule," it says, "where, in an election, representatives have been

chosen by a mere plurality of the votes cast or by a majority of the votes cast but by less than a majority of all employees entitled to vote." In the automobile industry, which must be fairly typical of the non-unionized industries, there is no clear majority for anybody. Seventy per cent of the voters are unaffiliated with any labor organization. Now what does Senator Wagner expect the Government to do in a situation like that? How is it to determine who has the exclusive right to speak for all the employees?

It would have to evade the question or make an arbitrary choice. But suppose it does somehow "certify" the exclusive representatives. What then? Is it going to try to force the employers to reach an agreement with them, and if so, how is it going to force an agreement?

The underlying fallacy of the whole bill is that Senator Wagner has not distinguished between protecting the right to organize and promoting union organization. The right to organize can be protected by elections. But the elections may not, as in the automobile industry, promote unionism. The bill is made quite unworkable by the wishful thought that a free choice will somehow result in A. F. of L. unions. . . .

It is a bad bill. It extends the scope of the Government's responsibility beyond the Government's power to discharge that responsibility. It sets up undefined rights and proposes to enforce them by the cumbersome process of litigation and prosecution. It distorts the device of election by the untrue assumption that elections will show a clear majority. The Administration and Congress will settle nothing by passing this bill. On the contrary they will multiply many times the troubles they have had with Section 7-A, the lawsuits, the non-compliance, the disappointment of labor.

The bill should, I believe, be scrapped and a wholly different bill drafted. It should be limited to a relatively small number of large industries that are unmistakably interstate in character. For these industries government intervention backed by legal compulsion should be limited to the conduct of free elections. Beyond that the government should make no effort to use compulsion to promote unionism or collective bargaining, but should confine itself to mediation and conciliation. This much it might hope to do effectively. To attempt more than it can do effectively is to create trouble for every one.



NEWS OF THE WEEK

Republic Steel's Loss Reduced in 1934; Inland's Profits Rise Sharply

THE Republic Steel Corp. had a net loss of \$3,459,428 in 1934 as compared with \$4,049,253 for the previous year, according to its annual pamphlet report. This is after all charges and expenses.

Net gain from operations after deducting charges for maintenance and repairs of plants was \$7,737,892. Other deductions included \$3,120,000 for interest on indebtedness and \$7,839,465 for depreciation and renewal of plants and for exhaustion of minerals. The corporation showed a net profit only in the second quarter when \$864,124 was earned. Quarterly losses were: first quarter, \$58,682; third quarter, \$2,988,600; fourth quarter, \$1,266,270.

Net sales during the year were \$81,522,105, gross profit \$15,302,753 and operating profit \$8,290,659.

Referring to the range of steel operations in the industry from 47 per cent in the first half to 27 per cent in the last half T. M. Girdler, chairman of the board, in his report to stockholders said that average costs for the year were not as low as they would have been with a more uniform rate of operations.

A reduction of \$1,365,150 was made in the outstanding funded debt of the corporation and its subsidiaries during the year and the preferred stock of the Trumbull Cliffs Furnace Co. was reduced \$275,600. Notwithstanding the capital expenditures and the substantial net loss for the year, net work-

ing capital was increased \$2,952,024. The transfer to current liabilities of \$2,510,500 funded debt which matures this year left a net increase in working capital of \$441,524.

With the April 1, 1934, 10 per cent wage increase in the industry the average wage of all employees exclusive of general administrative and sales forces, was approximately 69.8c per hr. It was pointed out that while hourly wage rates are now on a relatively high scale, the average number of hours worked by individuals under present conditions is low.

Production last year was: iron ore, 1,286,037 gross tons; coal, 2,283,450 net tons; coke, 1,750,905 net tons; pig iron, 1,231,515 gross tons and Bessemer, open-hearth and electric ingots, 2,004,689 gross tons.

Shipments last year were: finished products, 1,426,155 net tons; semi-finished products, 125,345 net tons, and pig iron 222,037 gross tons.

"Improvements since the beginning of the year have been very gratifying," said Chairman Girdler in his report. "Never has the necessity been more urgent for calm and intelligent consideration of industry's position in the country's economic picture. Enactment of immature Federal and State laws inimical to the interests, not only of business and industry but to the country as a whole, is a real danger. The voice of sober minded and patriotic stockholders can and

should be a powerful influence in tempering the character of present and future legislation."

Inland Earnings

The Inland Steel Co., Chicago, showed a net income of \$3,729,889 in 1934 as compared with \$166,693 in 1933, according to the annual report. The company's rate of operations last year averaged 53.1 per cent of capacity, as against 42.3 per cent in 1933. Net sales in 1934 totaled \$40,404,309, as compared with \$27,554,644 in the preceding year.

Selling costs, administrative expenses, etc., were \$30,962,099, compared with \$22,980,695 in 1933. The earned surplus account increased from \$15,628,927 at the end of 1933 to \$20,506,869 at the end of 1934. Current assets totaled \$23,007,154 as against \$20,599,201. Current liabilities were \$3,391,886 as against \$6,108,947 in the previous year.

Expenditures for new construction were \$1,408,045 and to complete this program an appropriation of approximately \$1,000,000 has been approved.

The company's plate at Milwaukee, consisting of 10 old-type sheet mills, has been dismantled and, with the exception of the value of the land and buildings, has been written off. This plant has not been in operation since November, 1931.

The report said that the company, on Dec. 31, 1934, had 10,231 employees. Total pay rolls for the year amounted to \$13,017,048, compared with \$8,980,681 for 1933. The average hourly wage for men was 67½c. in 1934, compared with 56c. in 1933.

Duty Increase Spurs British Iron and Steel Demand—Rails Placed

LONDON, April 1.—(By Cable).—British iron and steel markets are more active following the duties' increase. Pig iron consumers are anticipating increased requirements and placing more orders. Specifications are substantial, and stocks are decreasing.

Semi-finished steel is active and further expansion is expected. Finished steel is moving in large volume for miscellaneous work. A British railroad has ordered 80,000 tons of rails. An extended program of public works is anticipated. The export outlook is doubtful, but better business is being done with India and South Africa.

Tin plate demand has improved with buying for both home and export and fair inquiries. Operations are over 50 per cent of capacity.

The Continental iron and steel markets are unsettled by the Belga

devaluation, the new English duties and the political outlook, but some business is being done in overseas markets for urgent spring requirements. No business with the United Kingdom is likely until an agreement between Great Britain and the cartel is reached, and

a further meeting is scheduled for the near future.

At the Paris meeting between France and Germany regarding the Saar quotas, no complete agreement was reached and negotiations were postponed. Belgium, as a member of the International Raw Steel Cartel, is obliged to quote fixed sterling prices for export so that the advantage of Belga devaluation is uncertain. The International Wire Export Co. officially affirms that wire prices are not affected.

Dunbar Discusses Precision at Chicago

PRESENT day tolerances made possible by the use of properly designed abrasive machinery are not limited so much by the accuracy of the machines themselves as they are by the delicacy of available measuring devices. This was the claim advanced by Howard W. Dunbar, manager of the grinding machine division of the Norton Company, to members of the American Society for Metals, Chicago Chapter.

The layman's standard, "fine as a hair", is far too coarse for the manufacturer of precision parts, Mr. Dunbar pointed out. A hair has a diameter of about three one-thousandths of an inch, while hundreds of parts for the automobile and other high speed mechanisms are regularly machined to tolerances of one ten-thousandths of an inch, one-thirtieth of the diameter of a hair.

While the delicacy of micrometers has been extended considerably by the use of optical instruments to aid the naked eye, even more delicate measuring devices are now available for shop as well as laboratory practice. One utilizes the action of a steel rod in disturbing extremely weak magnetic fields, which, by the use of diamond contacts and a system of relays and solenoids, can control abrasive operations to a point beyond that possible with visual measurement. Another delicate test for the "perfect" surface is the infra-red ray. Infinitesimal imperfections in the surface are sufficient to cause refraction of part of the invisible ray into the visible spectrum.

Mr. Dunbar emphasized that only by improved methods of grinding, lapping, honing and polishing is it possible to produce precision parts necessary to high speed machinery, and to work the lighter,

tougher and harder alloy metals which are essential to speed.

Considerable interest was displayed in a discussion of one of the latest abrasive products of the electric furnace, boron carbide. The crystals, made by fusing boric acid with carbon, are the only substance which equals the diamond in hardness. Developed within the last two years, they have already been used as a substitute for diamonds in fine wire dies, and further research is in progress, seeking to substitute them for the diamond in other industrial uses.

Riehle Testing Machine Now Part of A.M. & M.

RIEHLE BROTHERS TESTING MACHINE CO., Philadelphia, manufacturer since 1825 of machines and equipment for physical tests of all materials, has become a part of American Machine & Metals, Inc., according to an announcement by E. P. Holder, executive vice-president of the latter organization.

Abbott F. Riehle will continue as general manager with headquarters at 100 Sixth Avenue, New York. The engineering staff and key men have been transferred from Philadelphia to the 83-acre plant of American Machine & Metals, Inc., at East Moline, Ill.

American Machine & Metals, Inc., is the parent company of the DeBothezat Corp.; Halliwell, Inc.; Oil Products Appliance Co.; Tolhurst Machine Works; Trout Mining Co.; and the Troy Laundry Machinery Corp.

The American Gear Manufacturers Association will hold its annual meeting at the Penn-Lincoln Hotel, Wilkesburg, Pa., (Pittsburgh), May 14 and 15. J. C. McQuiston is manager-secretary.

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton		
Ferromanganese, export	\$9	
Billets, open-hearth	\$5 10s.	to \$5 15s.
Tin plate, per base box.....	*18s.	2d. to 19s.
Steel bars, open-hearth	\$7 17½s.	
Beams, open-hearth	\$7 7½s.	
Channels, open-hearth	\$7 12½s.	
Angles, open-hearth	\$7 7½s.	
Black sheets, No. 24 gage	\$9 5s.	
Galvanized sheets, No. 24 gage.....	\$11 5s.	

*To June 1; 18s. 5d. to 19s. 3d. thereafter.

Official Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £

Current dollar equivalent is ascertained by multiplying gold pound price by 124.14 to obtain franc equivalent and then converting at present rate of dollar-franc exchange.

Billets, Thomas. £2 7s.	
Wire rods, No. 5	
W.W.G.	\$4 10s.
Steel bars, merchant	\$3 5s.
Sheet bars	\$2 8s.
Plate, ¼ in. and up	\$4
Plate, 3/16 in. and 5 mm. ...	\$4 2s. 6d.
Sheets, ¼ in. ...	\$4 7s. 6d.
Beams, Thomas. £3 2s. 6d.	
Angles (Basic). £3 2s. 6d.	
Hoops and strip base	\$4 2s. 6d.
Wire, plain, No. 8	\$5 7s. 6d.
Wire nails	\$5 15s.
Wire, barbed, 4-pt. No. 10	
B.W.G.	\$8 15s.

PERSONALS

C. B. NOLTE, for the last six years president of Robert W. Hunt & Co., Chicago, has been elected president of Crane Co., Chicago, to succeed JOHN W. BERRYMAN, who has been named chairman of the board. Mr. Nolte joined the Hunt company after his graduation from the University of Illinois in 1909 and became successively division manager, manager, vice-president, general manager, and in 1930 president. Mr. Berryman has been with the Crane Co. since 1892.

S. A. HELINGS, heretofore vice-president and general manager, Stewart Die Casting Corp., Chicago, has been elected president.

ALBERT C. LEHMAN, who has been president of Blaw-Knox Co., Blawnox, Pa., has been appointed chairman of the board, a newly created office. IRVIN F. LEHMAN, vice-president, has been elected president of the company, and FRANK CORDES has been made senior vice-president. At a directors meeting on March 29, all other officers of the company were re-elected.

FRANK J. TONE, president of the Carborundum Co., Niagara Falls, N. Y., has been awarded the Edward Goodrich Acheson medal by the Electrochemical Society. The award is made every two years to "the person who shall have made a distinguished contribution to the advancement of any of the objects, purposes, or activities of the society."

K. I. CLISBY, with headquarters at 74 Trinity Place, New York, has been elected vice-president of the Ohio Electric Mfg. Co., Cleveland, Ohio. He represents the company in eastern New York, Connecticut, western Massachusetts, and northern New Jersey.

B. F. DOWNEY, secretary and treasurer of the Yost Superior Co., Springfield, Ohio, is giving a dinner on April 6 to all factory and office employees in celebration of his 27 years of service with the company.

H. C. SENOUR, secretary and treasurer of Transue & Williams Steel Forging Corp., Alliance, Ohio, has been elected a director of the Mullins Mfg. Corp.

JAMES C. OGDEN, formerly vice-president in charge of the Robert W. Hunt Co.'s eastern and foreign activities at New York, has been

elected president of the company, succeeding C. B. NOLTE. Mr. Ogden has been identified with the company for the past 35 years. F. M. RANDLETT, heretofore Pacific Coast manager of the company at San Francisco, has been made vice-president and general manager.

M. A. BECKMANN, who has been identified with Aluminum Industries, Inc., Cincinnati, since its inception and has risen to his present position of works manager, has been elected a director of the company.

DELOSS WALKER, associate editor of *Liberty*, will be the guest speaker at a meeting of the Chicago Purchasing Agents' Association at the Bal Tabarin of Hotel Sherman, Chicago, on April 11.

CHARLES A. ADAMS, a director and plant superintendent of the Mathews Conveyor Co., Ellwood City, Pa., died after an appendicitis operation on March 23, aged 39 years. He had been associated with the company since 1912 and had filled key positions in both the manufacturing and engineering departments.

FRANK R. RHODES, former member of the firm of Eaton, Rhodes & Co., pig iron, coke and ferro-alloy agents, died at his home in Cincinnati on March 27, aged 57 years. Mr. Rhodes also was a former president and treasurer of the Modern Fuel Co. He was a graduate of Yale University.

CHARLES CLARK, for many years purchasing agent of the Pittsburgh Forge & Iron Co., Pittsburgh, died at his home in that city on March 27.

FREDERICK GEORGE JONES, of the M. D. Jones Iron Works, West Concord, Mass., and for the past 15 years superintendent of the Scott & Williams Foundry, also of West Concord, died on March 28 at the Emerson Hospital, Concord, after an operation for appendicitis. He was born in Boston May 23, 1873.

JAMES FRANCIS HIGGINS, for many years associated in an official capacity with Butts & Ordway Co., Boston, heavy hardware, died

HARRY EWERT has been appointed assistant sales manager of the welder division of the Harnischfeger Corp., Milwaukee. For the past 10 years, he has been identified with the production and sales of P&H Hansen welders, in association with the inventor, K. L. Hansen.

WALTER E. BARNES has been appointed assistant to F. H. GORDON, vice-president in charge of sales at Lukens Steel Co., Coatesville, Pa. Barnes joined the Lukens organization in 1910. He spent six years in the mills as scale weigher, marker, layerout and recorder. In 1916, he was transferred to the order department, and in 1927, to the sales department. Subsequently, he was appointed manager of claims and then assistant to general manager of sales, in which capacity he served until his recent appointment as assistant to vice-president.

at his home in Framingham, Mass., on March 28, aged 68 years. He had retired from business.

LAWRENCE M. KEELER, retired executive of the Whitin Machine Works, Whitinsville, Mass., died at Ormond Beach, Fla., on March 28, where he had been spending the winter. He was born in Orange, N. J., 65 years ago, and was graduated from Phillips Andover Academy in 1890.

W. H. HASSINGER, for more than 30 years in charge of southern operations of the old Republic Iron & Steel Co., and later president of the old Southern Iron & Steel Co., which was reorganized as the Gulf States Steel Co., died March 28, aged 73 years. He was one of the organizers of the old Anniston Ordnance Co. and Anniston Steel Co. in 1915. He was also interested in other companies, among them being the Birmingham-Goslin Mfg. Co. and the Swann Chemical Corp.

P. J. PAULY, for many years head of the Pauly Jail Building Co., St. Louis, died on March 8, aged 80 years. Mr. Pauly was active in the business up to about 90 days prior to his death.

E. E. GREEN, contracting manager at St. Louis for the American Bridge Co., died on March 30, aged 63 years.



THIS WEEK IN WASHINGTON

Interstate Commerce Commission grants freight rate increases on pig iron and steel and most raw materials going into their manufacture.

o o o

Administration's plan for reorganization of NRA finally given to Senate to forestall further criticism.

o o o

United States-Belgian reciprocal trade agreement proclaimed despite sharp devaluation of Belga.

o o o

Manufacturers ask Supreme Court test of legality of NRA following dropping of suit against lumber code.

o o o

Threatened coal strike averted as union reaches agreement with NRA to postpone final settlement until June.

o o o

BY L. W. MOFFETT

*Resident Washington Editor,
The Iron Age*

o o o

WASHINGTON, April 2.—If possible, Washington is becoming more of a bedlam day by day. . . . Business and industry are left in a daze. . . . Conflicting policies within the Administration itself. . . . Prospective legislation such as the Wagner Labor Disputes Bill which, is bitterly opposed by the vast majority of employers. . . . The 30-hr. week bill, less prospective, but a source of disturbance. . . . Organized labor making gestures, and only that in some cases, of huge strikes in textiles, automobiles, rubber. . . . Impending court cases over New Deal legislation, and further litigation to follow, as well as industrial conflicts, if such measures as the Wagner bill are enacted. . . . The picture is forbidding but not overdrawn. . . . It is clearly in the mind of industrial representatives who are trekking their way in large numbers to Washington these days to protest against pending legislative measures—protests that largely will be futile, according to all indications. . . . Uncertainty, an outstanding menace to recovery, holds full sway. . . .

To hit a few highlights. . . . An example of conflicting policies within the Administration: AAA levies high processing taxes for the "benefit" of the farmer. . . . Raw cotton prices advance, and so do

production costs and domestic selling costs, limiting demand. . . . Export markets for American textiles become more restricted. . . . Low priced Japanese textiles come into American market in such growing quantities as to spread alarm. . . . Efforts to stimulate domestic industry by artificially raising prices, to increase export markets, to "aid" farmers collapse. . . . Meanwhile, NRA steps in, inferentially criticizes AAA policy, and authorizes certain branches of cotton textile industry to slash hours of operation by not more than 25 per cent, with like reduction in number of machines, neither of which is very helpful for the durable goods industries. . . . Existing 40-hr. week thus is cut to 30 hr., which, instead of attaining long-sought goal of relieving employment and increasing purchasing power, has the opposite effect. . . . Whereat textile union threatens to strike in an industry whose cotton mills even the Federal Trade Com-

mission report showed made a profit of less than 4 per cent during the first half of 1934 with a deficit for the average mill during the succeeding two months. And, according to the cotton code authority, virtually the entire industry has been in red since last September. . . . But on with the strike, says the union. . . . And joining the chant, for again it may be said some of the noise is nothing more, albeit it adds to the general turmoil, come other A. F. of L. organizations.

The Wagner bill promises to be modified and moderated in some respects, thanks to impressive testimony given by such witnesses as Robert F. Caldwell, attorney for American Rolling Mill Co., whose quiet manner, yet devastating analysis of points in the bill, supported by a wide knowledge of the law, excited the admiration of Senator Wagner, himself a former judge, who told Mr. Caldwell, "It is evident you are an able lawyer."

... The bill was also sharply torn by other steel evidence both from the employer and the employee side, which may be a factor in developing a more moderate measure than the original. If "too moderate," however, in the eyes of organized labor, it would mean another rumpus from that source, with a resulting letdown in its recently acquired ardor in supporting extension of NRA, in return for getting Vice-President Phil Murray of the United Mine Workers on the NIRA, with hope of getting representation on all code authorities, and what not. ... Mr. Murray, however, was not permitted by Mr. Richberg to be one of the "arbiters" in the coal controversy. ... Like the other new member of NIRA, William P. Witherow, former steel executive, Mr. Murray was only an "adviser." ...

Coal operators, themselves at odds, also as usual, because of the question of wage differentials, did not appear to be greatly concerned. ... Some thought the union would "down tools" for a short time but looked for an early agreement and resumption of operations. ... And the NRA proposal for a status quo on wages and hours till June 16 was no surprise. ... Meanwhile to add to the joys of the more abundant life, Francis J. Dillon, American Federation of Labor organizer—or would-be organizer—told the Senate Committee on Education and Labor there would be a strike in the automobile industry unless the Wagner Labor Disputes Bill or similar legislation was passed. ... In making this threat before the Senators, Dillon added to its fearsome nature by saying the rubber workers would also be called out. ...

It was more or less gleefully predicted by organized labor leaders that at least 1,000,000 men would be called out in the four industries, coal, textiles, automobiles and rubber. ... Then of course this would automatically reduce employment in steel, and other industries. ... This spirit of "cooperation toward recovery," an extremely vital thing for the Administration in view of the near approach of another Presidential campaign, recalls that once upon a time the President proposed a labor truce. ... Rather the spirit appears to have become one where it might be reflected in a theme song, entitled "Why Work." ... Loaf and get paid for it. ... With the all-time peak appropriation of \$4,880,000,000 at hand for "work" relief, perhaps much "work" such as CWA did, the inducement to feed at the crib of the Federal treasury is great, and is heightened by the call of

spring. ... For it's a safe bet that, whether masked under the item of "work" or not, much more than the earmarked total of \$880,000,000 will go for direct relief and perhaps it would be just as well, if not better, were it not for the encouragement offered for strikes and for loafing at taxpayers' expense. ...

The President, in taking over personal responsibility for this huge outlay, caused comment in making Harry L. Hopkins the chief deputy administrator and likewise aroused added belief that after all the fund will be for direct relief more than had been anticipated. ... Mr. Hopkins has made a good record, all in all, as the chief spender of the country, a not happy role. First aid to Mr. Hopkins is Tugwell, of Brain Trust fame, with Admiral Peeples a prominent figure in the set-up. ... Harold L. Ickes, experienced in PWA, far short of accomplishing what it had hoped, is not given a leading role, a fact that inspired much Washington eye-lifting. ... Even the aids did not know what the money was going to be used for, much less Congress. ... It is a spectacle and commentary that Congress would vote such a tremendous appropriation without even having a general idea of its purpose. ... Rather liberal with other people's hard-earned money. ... The bill finally emerged without the Thomas inflationary amendment ... that helped a little. ...

As to New Deal litigations; another test case bobbed up just as the Government was backing down in the Belcher case. ... This time it is a steel case. ... Suit was filed in the Supreme Court by W. Ames & Co., Jersey City, N. J., maker of reinforcing bars, spikes, bolts, etc., attacking the constitutionality of NRA. ... Charge is made that the company suffered a practical boycott because it did not sign the steel code. ... The contention that NRA is unconstitutional is based on the point that it seeks to control matters not within Federal power, such as the hours of labor and minimum wages. ... So once again NRA comes in for attack as to its constitutionality and it wants fire withheld until after Congress has acted upon its extension. ... The first Ames suit was dismissed by the Supreme Court of the District of Columbia on Feb. 3. ... In that suit, directed against Government officials, the company attempted to compel purchase of its steel for road work and protested the executive order requiring bidders to file certificates of compliance before bids can be opened. ... The company argued that it was doing an intrastate

business and was entitled to contracts for State road work. ... The work was done with Federal funds. ... Justice F. Dickinson Letts, in holding against the company, said that "Congress has the unlimited power to prescribe such rules and regulations as it sees fit regarding the public works of the United States and for which funds are to be expended." ...

• • •

Threatened Coal "Strike" Averted

Back of the "settlement" of the so-called threatened soft coal strike in the Appalachian region is seen another maneuver by organized labor to bring pressure on Congress to enact legislation which organized labor is supporting. In informed circles it never was believed that the United Mine Workers were prepared to strike because of a failure—a studied failure—to reach an agreement with operators as to wages and hours in connection with renewal of contracts beginning April 1.

It was more or less dramatic of NRA to step into the breach at the eleventh hour and save the day but it was mostly political drama of which the country has seen a plenty. Agreement of the United Mine Workers and operators with the governing board of NRA to continue existing wage and hour contracts until June 16, date of expiration of the present recovery act, unless a new agreement is reached in the meantime, was nothing more than a paper victory for NRA. Unless it is that NRA thought by acting the role as "arbiter" it had espoused its own cause in getting much needed Congressional support for extension of the recovery act.

The fact is that the operators and United Mine Workers stage threatened strikes every year in connection with renewal of wage agreements. So common is the practice in fact that they are not taken at face value by any means. The "deadlock" this year, despite the fact that the negotiations were begun Feb. 18, was the usual thing, except that the United Mine Workers saw its opportunity of impressing Congress with implied threats of strikes unless Congress yielded to organized labor's demands for legislation.

President John L. Lewis of the United Mine Workers said the United Mine Workers' "concession" was not to the operators but to President Roosevelt. Mr. Lewis was aware from the outset that operators would not meet the union's demand for a 50c. increase in the basic daily wage and a slash from 35 to 30 hr. in the work week.

The long-drawn-out negotiations meanwhile were intended to disturb the country and Congress and to add to the growing turmoil in the labor situation. It has reached a point where strikes and threatened strikes, some not to be taken seriously, have become an epidemic and a decidedly serious deterrent to recovery. They apparently are "impressing" a generally radical Congress and it may be expected to push through at least some of organized labor's pet measures which will be laid at the door of the White House for approval or veto.

The United Mine Workers is said to have had the Guffy coal control bill in mind when Mr. Lewis said that if the "breathing spell" permitted by the coal agreement "can be utilized by Congress in enacting corrective measures and in the negotiation by the conferees of a more logical wage agreement than is now possible, then the action of the NRA board and the miners and operators in agreeing to this program will be splendidly justified."

Nevertheless, it is not believed that the Guffy bill, having the effect of nationalizing the coal industry, will receive Administration support and will not be enacted. However, organized labor also has in mind the Wagner Labor Disputes Bill, whose passage seems probable, perhaps with Administration support, and also the 30-hr. work week bill, which some but not all organized labor leaders want enacted.

Hull Believes Belga Devaluation Not Disturbing

Secretary of State Cordell Hull is of the opinion that devaluation of the Belga by 28 per cent is not sufficient to endanger the competitive situation between the United States and Belgium. For that reason, the reciprocal tariff agreement entered into between the two countries was proclaimed April 1, to become effective May 1. Either country can terminate the agreement on 30 days' notice.

That the Government's efforts to negotiate reciprocal tariff treaties is meeting with obstacles was made clear when the President, in proclaiming the Belgian treaty, sharply served notice that the United States will withdraw "most favored nation" treatment from countries discriminating against American commerce. The President made it known that the United States is considering denunciation of treaties or agreements with Germany, Denmark, Italy and Portugal and colonies. These countries now are extended the same treatment as

that given Belgium under the new treaty.

The President has written Secretary of Treasury Morgenthau, asking that the minimum duties be extended to these countries for only 30 days. Notice also was taken of discrimination against the United States by Canada, the Netherlands, Spain and Switzerland and the Secretary was notified to extend the minimum duties to these countries for only six months. In the meantime, treaties with these countries are being considered. The Belgian treaty becomes effective May 1.

At a press conference last Friday, when Belgium went off the gold standard, Secretary Hull pointed out that he had incorporated in the agreement an "escape" clause. Under the terms of this clause if the present devaluation of the Belga is held not to put American producers at a competitive disadvantage the agreement can be reopened and modified. On the other hand if the devaluation is held to jeopardize the interests of American producers, the agreement can be withdrawn entirely. Iron and steel producers have from the outset maintained, even without Belgian devaluation, that the agreement jeopardized them.

The escape clause reads as follows:

"In the event that a wide variation occurs in the rate of exchange between the currencies of the United States of America and the Belgo-Luxemburg Economic Union the Government of either country, if it considers the variation so substantial as to prejudice the industries or commerce of the country, shall be free to propose negotiations for modification of this agreement or to terminate it on 30 days' written notice."

Secretary Hull said the United States had been forewarned of Belgian devaluation. He declared that the situation would be watched closely and that the escape clause would be invoked if necessary.

Manufacturers Ask Supreme Court Test of NRA

Withdrawal by the Department of Justice of its NRA suit before the Supreme Court in the Belcher lumber case has been roundly criticized by the National Association of Manufacturers. C. L. Bardo, president of the association, has just called upon the Government to meet the Supreme Court test of its authority before further legislation is sought. The request that the Government stick to its guns and not beat a retreat came upon the heels of the Administration's

bill to extend NRA, which was suddenly introduced in the Senate last Friday by Senator Pat Harrison, chairman, Finance Committee.

Mr. Bardo, in asking that the Belcher case be allowed to come to a decision by the Supreme Court, said, "it is only through a clear definition of Federal authority in the industrial field that the uncertainty which obstructs recovery can be allayed." The Belcher case involves alleged violation of the wage and hour provisions of the lumber code.

"Eighteen Federal courts have handed down decisions denying the power of Congress to regulate local operations, but despite this record, the Government has not sought to clarify its powers," Mr. Bardo stated. "Meanwhile, Congress is being asked to act upon the extension of the NRA, the Wagner Labor Disputes Bill, the 30-hr. work week bill, the amendments to the agricultural adjustment act and other legislation involving exactly the same principles as those now in dispute—the right of the Federal Government to regulate strictly local affairs.

"If the Government pursues this course," it was added, "it will create a public impression that it fears a test of its questioned authority, yet insists on the exercise of doubtful powers."

Taxpayers' Delight

Bureaucracy is operating at capacity. It means a heavy strain on the overstrained Federal treasury, whose kitty is made up of taxpayers' contributions, but the more or less prideful boast that Uncle Sam is the country's largest employing agency is being maintained with a vengeance.

In Washington, where bureaus are in a constant scramble to find space, there were 94,050 persons employed at the end of 1934 in the civil executive branch of the Federal Government. This was the first time since Armistice Day, Nov. 11, 1918, that the number passed the 94,000 mark. On Armistice Day the total number employed in Washington was 117,760, the all-time peak.

Altogether, inside and outside of the District of Columbia, there were 672,273 persons in the civil executive branch on Dec. 31, 1934. Included in the figures are the so-called emergency agencies. Emergency agencies, however, once set up, generally become permanent agencies so that in the political lexicon they are almost synonymous. The figures are taken from a report by the Civil Service Commission.

Emergency Freight Rate Increases Are Granted on Steel and Raw Materials

WASHINGTON, April 2.—Emergency charges of 2c per 100-lb. on pig iron, certain iron and steel products and scrap iron and steel were granted by the Interstate Commerce Commission in its five to four decision announced Saturday. On coal and coke charges ranging from 3c. to 15c. per net ton were authorized, and on iron ore 10c. per net ton. A single increase is specified for so-called Lake cargo coal and iron ore, even though there may be two rail hauls separated by the water movement. No charge was authorized on less-carload traffic for distances generally less than 220 miles. The railroads had asked for a 10 per cent increase in rates on iron and steel.

The emergency charges, granted in lieu of general rate increases proposed by the carriers, are to become effective immediately upon the filing of blanket supplementary tariffs with the commission. They are to remain in effect until June 30, 1936.

It is not possible to say definitely when the new charges will become effective. The mechanics involved in printing and filing tariff supplements will be a factor after the form has been decided upon. This is now under consideration by railroad executives. It is thought that the emergency charges will be made operative by April 15. Some sources estimate later dates, ranging around April 20.

The 2c. per 100-lb. emergency charges allowed on iron and steel products and scrap are to be applied to the following list as set forth in the commission report:

Iron, pig.

Iron or steel, rated sixth class in Official Classification, n. o. s. (not otherwise specified).

Rails, fastening, frogs and switches.

Iron or steel pipe and fittings.

Iron or steel: nails and wire, not woven.

Iron or steel, rated fifth class in official classification, under the heading "Iron or steel"; also tin andterne plate.

Railway car wheels and axles.

Scrap iron and scrap steel.

On coke the emergency charge will be 3c. per net ton where the rate is 75c. or less; 5c. where it is 76c. to \$1; 10c. where it is \$1.01 to \$1.50 and 15c. where it is over \$1.50. Similar charges are allowed

on bituminous coal, Lake cargo taking the 15c. additional charge.

Switching Advances Also

An emergency charge of 10 per cent was authorized in connection with switching and certain other accessorial charges, subject to exceptions. The commission denied the carriers' proposal to authorize a charge of \$1 for issuance of order bills of lading. It is estimated that the emergency charges will net additional revenue of about \$85,000,000 annually, or one-half of what the carriers had sought.

In general, these emergency charges are similar, except in amounts, to those which were authorized by the commission in the advance rate case of 1931 and which were in force from Jan. 4, 1932, to Sept. 30, 1933.

The five commissioners voting for the emergency charges were Messrs. Meyer, McManamy, Lee, Mahaffie and Splawn. The minority opposing any increase were Chairman Tate and Commissioners Aitchison, Porter and Miller. The majority took the view that the

railroads are confronted by a grave emergency, marked by declining net earnings and rising costs due to increases in wages and prices of material, which warrants such measure of rate relief as may be accorded under present conditions during the next 15 months. They referred to various plans now under consideration which give promise of stabilizing the general transportation situation and improving the financial condition of the railroads but pointed out that aid from these sources is not likely to be afforded for some time.

The dissenting members said that railroad rates are now at the ceiling of reasonableness and that increases of a general nature would make them clearly unreasonable and tend to defeat their own purpose by accelerating the loss of traffic to competing forms of transportation.

As to beehive coke moving from producing points in the Appalachian region which are related by recognized differentials, the commission held that such differentials should be maintained and that the Connellsville, Pa., district should be considered the base group. It also requires maintenance of a certain relation between the rates on coal from Colona and Conway, Pa., and the rates from the Pittsburgh, Connellsville and certain other districts to Youngstown.

Administration Finally Presents Its Plans For NRA Future to Senate Committee

WASHINGTON, April 2.—Increased rather than decreased control over business by the Federal Government is provided for in the NRA Administration bill suddenly tossed into the Senate last Thursday by Chairman Pat Harrison of the Finance Committee.

Casting aside former pretensions that it would let Congress write the measure, the Administration hauled forth its own draft and introduced it in an apparent attempt to stem growing criticism in Congress. Attacks both on the floors of Congress and at hearings on the NRA before the Finance Committee were increasing and complaint was being made that the character of the new legislation, proposing extension of the recovery act for two years, had not been disclosed. Actually, however, it was known at the time the President recom-

mended extension of the act that the Administration had prepared a draft. It had been withheld until its introduction was forced by criticism. This is said to have been done as a matter of political strategy.

Fearful that rising hostility in Congress to NRA might prevent enactment of a new law before the present one expires on June 16, the Administration introduced the measure as a mere "basis for discussion." Even its supporters conceded that it is open to broad modification. Meanwhile the bill brought forth a wave of attack both in and out of Congress. The attack disclosed even more sentiment than heretofore for scrapping of NRA. The main attack, however, was against broader powers provided in the measure than exist in the present recovery act.

The proposed measure generally follows recommendations outlined to the Finance Committee by Donald Richberg, acting chairman of the N.I.R.B. While it would continue the recovery act in substantially its present form, it clearly reaches out for wider control over business. This is reflected in the proposal to confine codes to industries engaged in interstate commerce. Apparently as a means of meeting the vexing court decisions against NRA's constitutionality, the bill sets forth a definition of interstate commerce that is extremely far-reaching and entirely outside the commonly accepted court definitions of the commerce clause of the constitution. The Administration would be given the right to determine what industries are and what industries are not engaged in interstate commerce. It is the belief that service codes only would be lopped off from NRA control under construction of this definition and even some members of N.I.R.B. insist they should be classified as being engaged in interstate commerce.

Critics of NRA who assail it as promoting monopoly, permitting price-fixing and production control and assuming jurisdiction over intrastate commerce insist that the bill is worse in the last named respect than even the present law. The bill apparently recognizes these criticisms and seeks partially to meet them in its declaration against price fixing and monopolistic practices. Yet it carries a reservation that price fixing and production control may be permitted under codes to protect small enterprises and prevent unfair competition. The wide interpretation that may be given to this provision has been attacked by critics who say it is contradictory in view of the proposed ban on price fixing and production control and condemn it as a sop for those who contend that NRA promotes monopoly and suppresses small enterprise. They say that instead of partially restoring the anti-trust laws, as groups in Congress are insisting upon, the provision can be so construed as to have the opposite effect. The bill would permit price fixing and immunity from the anti-trust laws in the case of natural resource industries.

Section 7-A Not Clarified

The bill does nothing to clarify the much-disputed labor issue for it is recommended that Section 7-A be continued in its present form. However, the President would be authorized to impose limited codes,

regulating hours and wages, upon industries which are held to be exploiting labor. In cases of violation of hour and wage provisions, employees would be given the right to establish claims for damages through Governmental agencies. This is seen as a possible source of much litigation and confusion. Its inclusion in the bill is said to have been in response to demands of labor. The bill, however, does not meet demands of labor for representation on code authorities or for fixing hours and wages under codes that may be imposed by the President.

It is realized, however, that much may be done in the way of labor representation on code au-

thorities by N.I.R.B. administrative action, held to be a growing prospect by reason of the increased labor representation on the board.

The Blue Eagle apparently would in fact become a dodo, if it has not already become extinct. This is indicated by a provision authorizing NRA to promote compliance by the use of "distinctive insignia or labels." Provision is made for a fine, the amount as yet unspecified, for code violations, but the provision for prison sentence is eliminated, as are all licensing provisions. Provision is also made for extension of present codes for 90 days after expiration of the present law.

Colt's Company Defies NRA Compliance Board in Labor Dispute

THE Colt's Patent Fire Arms Mfg. Co., Hartford, Conn., last week notified the NRA compliance division that it would not comply with an order by the National Labor Relations Board directing the company in effect to recognize the joint committee of employees representing the unions at the plant as the exclusive collective bargaining agency for all employees. Subsequently the NRA ordered removal of the company's Blue Eagle and it faces the loss of large Government machine gun and other munitions contracts.

Company's Position

In a public statement explaining the company's action, S. M. Stone, president, said in part:

The company regards it as most unfortunate for its employees, many of whom have been with it for long periods, that they should suffer and be misled by professional union leaders whose real interests are in making trouble rather than helping those whom they profess to represent. The pay of these outside organizers depends upon fomenting trouble and obtaining union domination. Their attitude in endeavoring to hurt the business of the company is a clear indication that they are not working in the best interests of their members.

The company is not willing to submit to the demands of outside labor organizations. It is willing to deal with its own employees individually or collectively. It cannot allow all its employees, whether or not they prefer to be represented by unions to be subjected to the control of outside labor organizations. Such a situation is not

required by Section 7-A of the National Industrial Recovery Act and has not been acceded to in either of the large automobile or steel industries, nor can it be acceded to by this company.

In addition to this, while the company is not resting its case upon the point at the moment, there is grave doubt as to the constitutionality of the National Industrial Recovery Act and a number of the Federal courts have already held it unconstitutional as applied to situations similar to that with which the company is confronted. If business is to prosper, constitutional rights cannot be indefinitely disregarded. If business does not prosper, labor is bound to suffer.

The issue at the moment is whether the company is to be permitted to deal fairly with all its employees, fairly to them, and to the company, or whether the company is to be forced to submit to the dictation of labor leaders who have no direct interest in the company's welfare. No company can survive without a margin of profit or without the right to control its own affairs. Neither democracy nor majority rule can successfully run a business any more than a ship can be navigated by majority vote of a crew and without a captain. It is conceivable that Governmental bureaus or labor leaders might destroy a business but destruction would not benefit the employees.

The company hopes that within a reasonable period most of its employees will realize that it is their personal interests which are at stake and that it is in their own interest to return to work. The company does not intend to discriminate against any striker who seeks to return to work and who has not participated in violence or abuses during the strike.

Present Relations of Business to Government

KNOW that today I have the privilege of meeting a cross-section of what has become the malign element in our American life—the business, industrial and financial leadership of the country. You men are managing mills, factories, commercial establishments, banks and other units of our business structure. Therefore, you are the vivid answer to the question—what is wrong with the country today? You are the selfish obstructionists in the way of the multitudinous, altruistic, and celestial plans, which, if unimpeded, would make everything right with the country. For some time I have been so classified by the so-called New Deal.

The New Deal has just passed its second anniversary. There is no need to trace for you the history of those two years. Fresh in your minds are the crises and counter-crises, the rolling and boiling of events, the lush growth of the alphabetical jungles, the impact upon the country of sensation after sensation, the shifting moods, aspects, and public reactions, as first one, then another, shibboleth of salvation was sounded from the seats of the mighty in Washington.

Through all of this tumult and change there has been one constant thread. At times the professors and other oracles have had some doubt as to the exact nature of our national ills and the proper prescription for their cure. There never has been any doubt in the minds of the Administration as to where to fix the blame. The whole fault lies with the business men of the country, motivated solely by greed for profit and lust for power. Business is predatory, it is lawless, it is inhuman. Business is a veritable dragon whose sins cry to high heaven for a St. George.

NEW DEAL AND ITS RESULTS

When the New Deal began, its objectives, simply stated, were to relieve those in distress, to bring recovery as quickly as possible, and to eliminate or minimize conditions that produced the depression. It proposed to put the Government's house in order by rigid economies, and by friendly cooperation to aid business in every way in ridding itself of the economic ills that stood in the way of a return to prosperity. No one quarreled with those objectives. On the contrary, there was an enthusiastic, country-wide response such as has been accorded to few other administrations, and in which business joined wholeheartedly.

After two years what are the results? The number of persons on relief is greater . . . now more than 22,000,000. According to reliable estimates, unemployment, if public works are discounted, has not materially improved. The Federal debt has reached an all-time peak, and is rapidly increasing. Although natural gains have been made in many branches of industry, there is a prevalent, deep-rooted feeling of uncertainty. These are hardly indices of success.

It is not only a question of doing what is necessary to save the business of the country as a whole. It is our duty, as directors and leaders of industry, to resist the destructive forces leveled against us. The officers and directors of a corpo-

An Address by Ernest T. Weir, Chairman, National Steel Corp., before the Union League Club, Chicago, April 3

ration are only trustees for its stockholders. They owe a duty of good faith and fidelity to the people whose money is invested in their projects as well as to their employees and the public. Those who have been entrusted with the management of these trust funds have an obligation to perform and are not discharging it by sitting by while theorists experiment with the national wealth. Neither can anyone expect them to rush foolhardily into expansion programs or expenditures when nothing but threats, regulation, and political meddling come out of Washington.

Time will permit me to mention only a few of such proposals.

TYPICAL TIRADES

There are undoubtedly evils existing in the pyramiding of holding companies in the public utilities field, and no good citizen would have objection to any reasonable method of trying to eliminate these evils. However, the sweeping indictment of utilities indicates the probability of a future attack upon all holding companies.

As another example of a measure that would work great harm to industry, consider the 30-hour week bill. This is not supported by the Administration, but it has many advocates in Congress, and it has been urged consistently by the American Federation of Labor. Yet a thorough study of this proposal by the Brookings Institution proves that a 30-hour week would not support a standard of living as high as that of 1929, which certainly was none too high.

THE BANKHEAD BILL

Then, in another direction, you have the bill introduced by Senator Bankhead of Alabama as a direct attack on the basing point system in the steel industry. Here you have a case of a Senator taking action, apparently with no knowledge whatsoever of the subject that he is attempting to regulate by law. Criticisms by his own constituents from Birmingham forced the good Senator to announce that before pressing his bill he would "give more study to its potential effect upon Alabama industries." The steel industry has been one of the most competitive in the country. Throughout its history it has been a case of every unit fighting as hard as it could for business—as I can well testify. Despite this condition, the basing point system has been accepted by all of these units and has endured for many years. The only conclusion to be drawn is that the system is economically sound. Yet, Senator Bankhead would upset this system by a legislative wave of the hand.

Probably the most harmful attitude, and the action most likely to block the return of recovery, has been expressed in legislation dealing with labor relations. I wish to call your attention particularly to the Guffey Bill and the Wagner Bill.

The announced intent of the Guffey Bill is to stabilize the bituminous coal industry, and conserve coal resources. In its labor provisions, this bill attempts to make it necessary, now and permanently, for employers to deal only with national labor unions in all collective bargaining. It states that minimum wages in any given district shall be those agreed upon with representatives of the majority of mine workers therein "belonging to a recognized national association of mine workers." It denies to employees not belonging to a recognized national association any voice whatsoever in the determination of their conditions and terms of employment, even though, conceivably, such employees might be in the majority in a given district or at least in individual mines. This probably is the boldest attempt ever made to establish unions by law.

The Wagner Labor Relations Bill is one of the most vicious pieces of legislation ever proposed. It seeks to write into the law a principle of eternal warfare between employer and employee. The real purpose of the bill is to outlaw all plans of employee representation which do not function in connection with the American Federation of Labor. Organizations of the employees of a particular employer, sometimes called "company unions," are assailed as "company dominated unions," in utter disregard of the facts. Industry never could operate successfully under such a law. The great preponderance of employees do not want it, and will resent it if it is passed. Every man in this room and every interest you represent should rise up without delay against this destructive measure. This is only indicative of the efforts being made that will handicap progress by catering to selfish and short-sighted minorities.

EMPLOYEE REPRESENTATION

Employee representation plans as a means of collective bargaining have been known for many years in England and on the Continent. Some of the largest companies in this country have had employee representation plans, effectively operating among their employees, for many years. Notwithstanding this long record of successful operation and that millions of employees in the United States operate under these plans, a powerful lobby of labor leaders in Washington is seeking to outlaw these organizations. Naturally, the existence of such effective means of collective bargaining, at no cost to the employees, is a thorn in the side of professional labor leaders. They can prosper only by having an organization which collects dues and imposes fines. The American Federation of Labor, not content with the present state of the law which does not prohibit it from using all manner of force, violence and intimidation in the building up of its membership, seeks still further to outlaw its chief competitor, and issues propaganda day by day attacking and misrepresenting the so-called "company

unions." Yet industry remains almost silent in answering this propaganda.

This same Mr. Green, in commenting upon the Weirton decision, as quoted in the New York Times, had the effrontery to say the decision was "evidently based upon either a misunderstanding or misinterpretation of facts."

Without comparing qualities of the two men, I should like to point out that Mr. Green could not possibly have known all the facts, and that what he did know was at second hand . . . that Judge Nields was in contact with the case for almost a year, saw every witness, heard every scrap of testimony, and every argument that could be advanced by Counsel on either side. Mr. Green also said: "It is inconceivable that either labor or public opinion will support the extension of corporate power over the economic strength of the workers through the establishment and maintenance of company unions" . . . a continuance of the same old line of attack upon employee plans. Many other labor leaders have made statements to the same effect. In other words, if justice, as interpreted in the courts of the United States, does not coincide with the opinions of labor leaders, then the devil take the courts. Every one of these statements is designed to give the public the impression that the Employees Plans are vicious things, and that organized labor, and inferentially the great body of American workmen, are being maliciously deprived of a natural right.

Please bear in mind that the Weirton decision does not take away from the workmen of this country a single thing. They had and have the right of collective bargaining, and can exercise that right in any way that they see fit. Labor leaders rant against the decision because it stands in the way of a complete unionization of industry, always their goal and one they expected the present Administration to hand them on a silver platter despite the fact that by their own efforts, by persuasion and by less laudable means, they never have been able to enlist more than ten per cent of the workers of the country under their banner. That the average workman still has little use for them was clearly demonstrated in the recent automobile elections.

In our case, the United States District Court for Delaware, after fifteen months of litigation, after hearing 283 witnesses, and after taking almost six thousand pages of testimony, filed an opinion completely vindicating our position and establishing the employee representation plan as a legal and effective means of collective bargaining. At the December elections in our Weirton plants, after all this assault upon us, both by the American Federation of Labor and by high officials in governmental circles, 98 per cent of our employees participated in an election to choose representatives under the employee representation plan. I have the utmost confidence in the intelligence and ability of the working people of this country to make their own decision as to their representation in labor matters.

A COMMON GOAL IS INDISPENSABLE

Relationships between employers and employees will be one of the most important elements in our future progress. We know that the cooperative attitude, the common goal rather than divergent ends, is indispensable. But there must be honesty in purpose and a sense of fair play on both sides; there must be some medium that

will in a day by day manner emphasize the community of interest between employer and employee.

It is my firm conviction that there is no more effective medium for the relationships between employer and employee than the employee representation plan. As established at our plants, it has operated for nearly two years to the satisfaction of the vast majority of employees.

So far, I have cited specific examples of the things that have fostered uncertainty and lack of confidence . . . these many unsound and radical proposals coupled with the antagonism behind them, and abetted by the indisposition of business men to fight them. As far as the Administration is concerned, it might be said, in general, that the trouble is reform to the exclusion of recovery. To try now, when every part of our business, social, and economic structure is weakened by strain, to effect over-night reforms can have nothing but the effect it is having . . . to retard recovery.

In the meantime, people are being educated to believe that they have no individual responsibility for their own welfare or that of the country. It is constantly expounded that conditions overwhelm the individual man, and that he cannot cope with them by his own efforts. More and more, Government has assumed the attitude of a good godfather to whom people—and even business firms—have a right to look for beneficence. This is a direct inversion of what has always been considered a cardinal principle of government. Government can give nothing of itself. Whatever it has must come from its people. Therefore it is an impossibility for government to support the people. In the long run, the people must support themselves, and in addition, support government. This principle seems forgotten today.

Do not misunderstand me. I sympathize with misfortune, and fully recognize the necessity for relief. No one in this country must be permitted to go cold, hungry or unsheltered. But relief should be recognized for what it is—a stopgap pending the earliest opportunity to become self-supporting. The whole aura surrounding this condition is vicious. It is establishing a mental attitude that is corroding the spirit of individual responsibility and independence that has been a marked trait in this country. And the future of civilization depends on the development of individual responsibility. The quickest solution to this problem, is, of course, jobs . . . recovery.

It is elementary good sense that the first goal of government should be recovery. This is what it professes to want. If it is sincere, it will start doing the things that will bring recovery, and stop doing the things that retard it. It will put its own house in order, and cut out every unnecessary governmental expenditure. It will call a truce on hasty reform and the vindictive spirit. It will withdraw Federal participation from all fields in which Federal participation is not proper under our Constitution. Remembering the advice of Cicero that "In the most corrupt country you will find the most laws," it will cease trying to enmesh the business, financial and industrial organizations of the country in new entanglements of legal barbed wire. It will revive its original idea of self-government of business, and do the things that will encourage business to go forward. Recovery cannot start without the right conditions, not because of any voluntary desire to hold back, but because

of inherent economic factors. Let these conditions be established, let confidence be restored, and business will take care of the rest of the job. All the government relief and job-making combined is not a drop in the bucket compared to the prosperity-making capacity now lying inert in business through lack of confidence.

Now I may have seemed pessimistic in some of the remarks I have made. If you have gathered that impression, you are right . . . so far as the immediate outlook is concerned . . . because I see so widely prevalent ideas and attitudes that are denials of the spirit and resource that have made this country. But for the future, I am hopeful if only our people stand firmly on sound principle, and through their own good sense and judgment overcome the difficulties of the hour . . . if they refuse to be carried away by the avalanche of false propaganda being launched every day by a score of prophets and speechifiers who know not of what they speak. Our people must save themselves by study, consideration, and steadfast adherence to principles of proven worth.

It is the responsibility of every business man to be articulate. The people down in Washington are doing the things they do and saying the things they say because they think that's what most of the people want. Unless they hear differently, the politician-mind will dictate that they go on thinking that. It is up to you as business men to take the lead in changing that mind, and there are a number of very practical things you can do.

The first is to know what is going on, then study it carefully. When you find something in which you do not believe—use your influence, point out to your associates and employees just how it will affect business and therefore them. Point out to the community how it will affect all related business in the community. Urge your employees and your fellow-citizens to register their will down in Washington where it counts. Work with your trade associations to do exactly the same thing over a wider area. Of course, it cannot be expected that all business can take a united stand on all issues. This is not possible. But there are many broad issues today upon which business will take pretty much the same position and it is these issues that have most capacity to help or harm. If business men throughout the country, each in his own sphere of influence, take the trouble to become aware of what is going on and have the courage to take a stand, and urge action, results will soon become apparent. I believe there is a much greater proportion of our population than any of us realize waiting to respond to leadership of this order. Crystallized, this body of opinion can act with gyroscopic effect upon the zigzagging course of national events—can serve to bring us closer to the golden mean that lies between extremes, and closer to the recovery which must be our goal.

My exhortation to you is to be vigilant in the fight, carry it to the people, make them see the fallacy of the radicalism, and the folly of the demands for over-night change emanating from Washington. The highest patriotic service that can be given by men who still have elements of political and economic sanity is to help bring us through the hysteria of this depression as a country that still reveres the ideals of Founders who wrote a Declaration of Independence, and gave us a Constitution based upon a promise of Liberty.

Steel Gaining Impetus, Says Taylor at U. S. Steel Meeting

Sees Possibility of Domestic Output of 800 to 900 Pounds Per Capita if Foreign Steel Dumping Can Be Curtailed

NEW YORK, April 2—In his address to stockholders at the Steel Corporation annual meeting, at Hoboken, N. J., April 1, Myron C. Taylor, chairman of the board, expressed the belief that the forward movement in the steel industry, as in other lines, is plainly gathering impetus. "When it advances sufficiently," he said, "it should sweep away all unsound policies which our great prosperity in the past has engendered, and also many quack notions which have been born of our adversity."

In the first three months of the current year, United States Steel received orders for 1,774,272 tons of products, an average of 26,482 tons a day, or at the rate of 41.9 per cent of the corporation's capacity, comparing with 1,504,015 tons in the corresponding quarter last year, a daily average of 22,448 tons and 35.5 per cent of capacity and with 631,000 tons, 9292 tons daily and 14.9 per cent of capacity in the initial quarter of 1933, Mr. Taylor reported.

"With these figures before us," Mr. Taylor said, "and fully realizing that our country is still young, rich in natural resources, and has a low density of population, and still presents plenty of opportunities, even along pioneering lines, our optimism should dispel the clouds which the depression has brought forth."

"It would not be strange if a depression complex had been generated in the public mind. Yet there is an inspiring morale throughout the nation."

"We have been passing through a difficult period in industrial history, a trying period for the corporation. Because of our far-flung activities in this nation and in many parts of the world, we have been subjected to an unusual degree to those influences which are widespread and to those particular to localities in which we operate."

"We have had, as well as the ordinary economic difficulty, difficulties concerning the manufacture and sale and distribution of products, to counsel with ourselves and with others and with leaders of our national government in respect to very grave questions which determine for the

time being and which will influence probably for all time the relationships between government and organized industry, and between the employer and the employee, and between industry's organizers and its owners, the stockholders."

"It has been a most difficult and trying period in which to preserve poise and balance, to be considerate of the interest of all groups who are related directly or indirectly to this corporation and its activities. It has been trying and difficult for your management to carry the burdens of this corporation through another, the fifth, year of a great depression of magnitude not before witnessed in the memory of men of this generation nor in the history of this nation, unaccompanied by war itself."

"We have through courage been able to carry on through these distressing times because of a feeling of support and loyalty which the stockholders and the employees of this corporation and all its branches were giving to us who were undertaking to guide it, and we are affected with a very deep and very real sense of gratitude and obligation to the stockholders and the employees for that support."

With regard to the long term outlook for the industry, Mr. Taylor said:

"The curve of steel consumption in the United States taking five-year averages, up to the beginning of the depression (eliminating the war period), shows an increasing average consumption for each successive five-year period."

"In 1890 steel production was at the rate of 257 pounds per capita, and it kept increasing up to 1930 when the five-year period shows a production of 902 pounds per capita. The maximum of 1,030 pounds was reached during the year 1929."

"The trend chart indicates that, based on the past, the year 1950 would have shown a consumption of 1,180 pounds per capita, or 79,000,000 tons for the entire country. The modified trend, taking into account a slowing up of the increase in population, still shows a possible consumption of 1,000 pounds of steel per capita."

"The depression has seriously disturbed the trend curve, as the consumption per capita dropped to a low of 151 pounds in 1932, but has been increasing gradually to 327 pounds in 1933 and 378 pounds in 1934. The

natural question is, What are the possibilities for the future?

"A glance at what the European countries are doing might be of interest. In 1929 they had a production of 500 pounds per capita. In 1932 this had dropped to about 250 pounds per capita. In 1934 this had again increased to 400 pounds per capita. These countries with centuries of background, and with a very high density of population per square mile, may be considered as fairly well stabilized with relatively small possibilities of very much of an increase in steel production per capita."

"The density of population, or population per square mile, is shown by the following:

	Population Per Square Mile
France	197
Germany	345
British Isles	405
Russia	20
United States	41

"These figures serve as an index as to the requirements for further development of the respective countries and indicate the relative capacities of supporting a greater population, as well as the necessity for seeking foreign markets."

"United States shows very good possibilities for the future as referred to density of population, as our population per square mile is but 20 per cent of that of France, 12 per cent of that of Germany, 10 per cent of that of the British Isles and but twice that of Russia."

"The backlog of steel requirements due to deferred repairs, maintenance and construction during the five years of the depression should certainly provide a large reservoir to be drawn upon in the rebuilding and building in the near future."

"When business again picks up we see no reason why we should not again reach a steel production of 800 to 900 pounds per capita, provided we curtail in some measure the tendency for flooding our own home markets with European steel."

In closing his address, Mr. Taylor said:

"The forward movement already begun is plainly gathering impetus and it should, when it advances, sweep away all unsound policies which our great prosperity in the past has engendered and many quack notions which have been born of our adversity."

"These in time will be forgotten, and the real America in its simple, straightforward way will again lead world progress."

The stockholders re-elected the retiring directors and approved a plan for group life insurance for employees, to be borne partly by the corporation and partly by the employees. They also rescinded the employees' profit-sharing and stock subscription plans, which had been in existence for many years.

March Pig Iron Output Up But Daily Rate Was Slightly Lower

PRODUCTION of coke pig iron in March totaled 1,770,028 gross tons, compared with 1,608,552 tons in February. The daily rate in March, at 57,098 tons, decreased but 0.6 per cent from the February rate of 57,448 tons a day.

There were 98 furnaces in blast on April 1, making iron at the rate of 57,295 tons a day, against 96 furnaces on March 1, operating at the rate of 56,695 tons a day. Seven furnaces were blown in during the month, of which one was a Steel Corporation unit, two were independent steel company furnaces and four were merchant furnaces. The Steel Corporation blew out or banked five furnaces.

Among the furnaces blown in were the following: One Donora, American Steel & Wire Co.; one Steelton, Bethlehem Steel Co.; one Neville Island, Davison Coke & Iron Co.; one Madeline, Inland Steel Co.; one Pioneer, Republic Steel Corp.; one Swede, Alan Wood Steel Co., and one Palmerton, New Jersey Zinc Co. The Jones & Laughlin Steel Corp. changed over one of its Aliquippa furnaces to ferromanganese.

Furnaces blown out or banked included: One Carrie, one Ohio, Carnegie Steel Co.; two Monongahela and one Lorain, National Tube Co.

Daily Average Production of Coke Pig Iron

	Gross Tons			
	1935	1934	1933	1932
January	47,656	39,201	18,348	31,380
February	57,448	45,131	19,798	33,251
March	57,098	52,243	17,484	31,201
April	57,561	20,787	20,787	28,439
May	65,900	28,621	25,276	20,935
June	64,338	42,166	20,935	20,935
½ year	54,134	24,536	28,412	28,412
July	39,510	57,821	18,461	17,115
August	34,012	59,142	17,115	19,753
September	29,935	50,742	20,800	21,042
October	30,679	43,754	38,131	23,733
November	31,898	36,174	23,733	23,733
December	33,149	38,131	23,733	23,733
Year	43,592	36,199	23,733	23,733

Production of Coke Pig Iron and Ferromanganese

	Gross Tons		Ferromanganese†	
	Pig Iron*		1935	1934
	1935	1934	1935	1934
January	1,477,336	1,215,226	10,048	11,703
February	1,608,552	1,263,673	12,288	10,818
March	1,777,028	1,619,534	17,762	17,605
April	1,726,851	1,726,851	15,418	15,418
May	2,042,896	2,042,896	10,001	10,001
June	1,930,133	1,930,133	10,097	10,097
½ year	9,798,313	9,798,313	75,642	75,642
July	1,224,826	1,224,826	10,188	10,188
August	1,054,382	1,054,382	8,733	8,733
September	898,043	898,043	7,100	7,100
October	951,062	951,062	9,830	9,830
November	956,940	956,940	8,134	8,134
December	1,027,622	1,027,622	4,563	4,563
Year	15,911,138	15,911,138	124,190	124,190

*These totals do not include charcoal pig iron. The 1933 production of this iron was 32,941 gross tons.
†Included in pig iron figures.

Merchant Iron Made, Daily Rate

	Tons			
	1935	1934	1933	1932
January	3,926	7,800	2,602	6,256
February	6,288	7,071	2,863	7,251
March	7,089	7,197	2,412	7,157
April	8,838	8,838	1,908	5,287
May	9,099	9,099	3,129	4,658
June	9,499	9,499	4,088	6,090
July	7,880	7,880	6,783	3,329
August	6,043	6,043	7,756	3,070
September	4,986	4,986	10,034	3,213
October	5,765	5,765	8,634	4,286
November	6,610	6,610	7,639	4,435
December	4,399	4,399	8,358	3,674

Production by Districts and Coke Furnaces in Blast

Furnaces	Production (Gross Tons)		April 1		March 1	
	March (31 Days)	February (28 Days)	Number in Blast	Operating Rate, Tons a Day	Number in Blast	Operating Rate, Tons a Day
New York:						
Buffalo	105,539	102,199	5	3,405	5	3,650
Other New York and Mass.	6,194	.....	1	200	1	205
Pennsylvania:						
Lehigh Valley	29,791	24,551	3	1,015	3	780
Schuylkill Valley	.....	.....	1	265	0	.....
Susquehanna and Lebanon Valleys	6,790	.....	1	485	0	.....
Ferromanganese	.....	.....	0	.....	0	.....
Pittsburgh District	334,740	314,620	16	11,140	18	10,920
Ferro. and Spiegel	8,132	4,435	3	285	1	160
Shenango Valley	34,881	38,526	3	1,125	3	1,040
Western Pennsylvania	43,521	47,184	3	1,405	3	1,865
Ferro. and Spiegel	6,530	5,938	1	210	1	210
Maryland	71,987	60,975	3	2,320	3	2,180
Wheeling District	128,793	112,282	6	4,155	6	4,010
Ohio:						
Mahoning Valley	204,222	196,066	9	5,895	10	6,735
Central and Northern	197,121	188,675	10	5,855	11	6,740
Southern	38,240	34,187	3	1,235	3	1,220
Illinois and Indiana	338,517	306,923	16	11,360	15	10,580
Mich. and Minn.	54,539	47,594	3	1,760	3	1,700
Colo., Mo. and Utah	22,628	20,979	2	730	2	750
The South:						
Virginia	.....	.....	0	.....	0	.....
Ferro and Spiegel	3,100	1,915	1	100	1	70
Kentucky	14,845	12,964	1	480	1	465
Alabama	119,918	88,539	9	3,870	3	3,415
Ferromanganese	.....	.....	0	.....	0	.....
Tennessee	.....	.....	0	.....	0	.....
Total	1,770,028	1,608,552	98	57,295	96	56,695

Great Lakes Orders Strip Mill From Mesta

PITTSBURGH, April 1.—The Mesta Machine Co. has been awarded the contract for a 79-in. 4-high continuous hot strip mill and a 4-high cold strip mill by the National Steel Corp., to be installed at its Great Lakes plant at Ecorse, Mich. This is the fourth project for which the Mesta Machine Co. has furnished equipment which has been practically identical in quantity, dimensions and detailed construction.

The first of these units was furnished to the Inland Steel Co. under contract dated Dec. 1, 1930, and was placed in operation the latter part of the following year. The second unit was taken by the Youngstown Sheet & Tube Co. under contract on June 15, 1934, and was placed in operation on March 12, 1935. The third unit is now under construction for the Bethlehem Steel Co., under contract of Feb. 15, 1935.

Monthly Report of Metal Working Activity

These Data Are Assembled By THE IRON AGE From Recognized Sources And Are Changed Regularly As More Recent Figures Are Made Available. Boldface Type Indicates Changes This Week

	February, 1935	January, 1935	February, 1934	Two Months, 1935	Two Months, 1934
Raw Materials:					
Lake ore consumption (gross tons) ^a	2,467,269	2,280,393	1,727,746	4,747,662	3,338,149
Coke production (net tons) ^b	2,873,432	2,889,552	2,622,594	5,762,984	5,206,279
Pig Iron:					
Pig iron output—monthly (gross tons) ^c	1,608,552	1,477,336	1,263,673	3,085,888	2,478,899
Pig iron output—daily (gross tons) ^c	57,448	47,656	45,131	52,303	42,016
Castings:					
Malleable castings—production (net tons) ^d	41,377	43,400	33,939	84,777	64,356
Malleable castings—orders (net tons) ^d	41,225	44,568	36,594	85,973	69,095
Steel castings—production (net tons) ^d	29,687	29,035	28,526	58,722	56,170
Steel castings—orders (net tons) ^d	31,725	32,349	35,698	64,074	61,994
Steel Ingots:					
Steel ingot production—monthly (gross tons) ^e ..	2,742,125	2,834,170	2,182,826	5,576,295	4,154,247
Steel ingot production—daily (gross tons) ^e	114,255	104,969	90,951	109,339	81,456
Steel ingot production—per cent of capacity ^f ..	51.61	47.67	41.31	49.66	36.99
Employment in Steel Industry:					
Total employees ^g	420,397	407,071	403,298	413,734	398,155
Total payrolls (thousands of dollars) ^g	44,213	44,329	35,425	88,542	35,151
Average hours worked per week ^g	35.6	33.6	31.9	34.6	31.6
Finished Steel:					
Trackwork shipments (net tons) ^h	2,892	2,333	3,310	5,225	6,121
Sheet steel sales—(net tons) ⁱ	183,322	321,831	184,355	505,153	393,818
Sheet steel production (net tons) ^j	219,062	235,714	194,830	454,776	358,452
Fabricated shape orders (net tons) ^k	70,980	60,451	75,294	131,231	166,888
Fabricated shape shipments (net tons) ^k	65,430	86,155	47,509	151,585	125,132
Fabricated plate orders (net tons) ^k.....	.....	18,778	14,641	.....	30,538
Reinforcing bar awards (net tons) ^k	22,265	15,600	17,625	37,865	35,425
U. S. Steel Corp'n. shipments (tons) ^l	583,137	534,055	385,500	1,117,292	717,277
Ohio River Steel Shipments ^{ll}	64,369	52,656	4,373	117,025	58,142
Fabricated Products:					
Automobile production U. S. and Canada ^{dd}	358,658	303,372	240,278	662,030	404,089
Construction contracts (37 Eastern States) ^l	\$75,083,500	\$99,773,900	\$96,716,300	\$174,857,400	\$283,180,000
Steel barrel shipments (number) ^m	402,928	438,334	572,915	841,262	1,279,262
Steel furniture shipments ⁿ	\$1,064,219	\$1,139,497	\$894,076	\$2,203,716	\$1,890,914
Steel boiler orders (sq. ft.) ^d	281,646	391,784	227,093	673,430	462,869
Locomotive orders (number) ^k	1	0	20	1	20
Freight car orders (number) ^k	806	24	20,227	830	20,377
Machine tool index ^l	53.0	65.5	50.9	†61.5	†58.2
Foreign Trade:					
Imports of pig iron (gross tons) ^m	10,741	2,033	10,777	12,774	22,663
Imports of rolled steel (gross tons) ^m	11,024	14,180	6,456	25,204	13,639
Exports of all rolled steel and iron (gross tons) ^m ..	63,739	69,491	72,282	133,230	154,422
Exports, finished steel (gross tons) ^m	59,147	66,523	69,124	125,670	148,569
Exports of scrap (gross tons) ^m	156,332	186,112	75,884	342,444	163,156
British Production:					
British pig iron production (gross tons) ⁿ	483,100	521,200	414,400	1,004,300	855,700
British steel ingot production (gross tons) ⁿ	769,500	757,800	707,500	1,527,300	1,542,000
Non-Ferrous:					
Lead production (net tons) ^o	27,398	30,674	34,349	58,072	72,919
Lead shipments (net tons) ^o	32,518	34,164	25,778	66,682	59,689
Zinc production (net tons) ^p	33,072	35,614	30,296	68,686	63,373
Zinc shipments (net tons) ^p	34,903	35,538	32,485	70,441	59,141
Deliveries of tin (gross tons) ^q	3,905	4,600	2,940	8,505	6,250

*Preliminary. †Three Months' Average.
Sources of figures: ^a Lake Superior Iron Ore Association; ^b Bureau of Mines; ^c THE IRON AGE; ^d Bureau of the Census; ^{dd} When preliminary, from Automobile Manufacturers Association—Final figures from Bureau of the Census; ^e American Iron and Steel Institute; ^f National Association of Flat-Rolled Steel Manufacturers; ^g American Institute of Steel Construction; ^h United States Steel Corp'n.; ^{ll} U. S. Engineer, Pittsburgh; ⁱ F. W. Dodge Corp'n.; ^j Railway Age; ^k National Machine Tool Builders Association; ^l Department of Commerce; ^m British Iron and Steel Federation; ⁿ American Bureau of Metal Statistics; ^o American Zinc Institute, Inc.; ^p New York Commodities Exchange.

Steel Output Rises Slightly With Demand Well Sustained

Ingot Rate Up Half Point to 47 Per Cent of Capacity—March Pig Iron Output Higher With Daily Production Practically Unchanged

WITH demand for finished steel products sustained at a far better rate than would seem to be justified by the current business uncertainty, steel ingot production has risen one-half a point to 47 per cent of capacity. While the gain is not significant and curtailment in operations is already predicted for next week in some districts, the industry's stubborn resistance to a further decline in activity is clearly shown.

Pig iron production in March was sustained at almost the same level as in the preceding month. Total production rose from 1,608,552 tons in February to 1,770,000 tons in March, because of the increased number of working days, but last month's daily rate was 57,100 tons, compared with 57,450 tons in February. Two more stacks were in blast April 1 than one month before, and the 98 furnaces were making iron at a rate of 57,300 tons daily, compared with 56,700 tons by the 96 stacks in blast on March 1.

THE week emphasized a number of factors which might lead to increased steel production during the second quarter. The automobile industry is still deferring heavy purchases for its May and June requirements. This buying cannot be put off much longer, and, if retail automobile demand holds up or continues to expand, the industry's requirements will be substantial and provide considerable impetus to steel demand.

It is probably significant that steel production is higher this week at Chicago, Cleveland, Buffalo and Detroit, all centers where automotive buying is an important factor. The rate is up $3\frac{1}{2}$ points to 50 $\frac{1}{2}$ per cent at Chicago, two points to 56 per cent at Cleveland, five points to 95 per cent at Detroit and three points to 35 per cent at Buffalo. Output is unchanged in the Pittsburgh, Philadelphia and Wheeling districts and down five points to 50 per cent in the Valleys.

IN the Middle West the requirements of implement makers are well sustained and signs of spring activity are clearly discernible in many lines. Fully 22,500 tons of reinforcing bars is immediately pending for large jobs in the Chicago district alone and a large tonnage of plates is involved in dam construction which will get under way as soon as Federal funds are available. Other new plate jobs call for 8550 tons, of which 8000 tons is for oil tankers.

Fabricated structural steel bookings total 8300 tons, compared with 17,600 tons last week, but include no outstanding projects. New structural inquiry calls for 9300 tons, against only 2600 tons in the preceding week. Fabricators' backlogs were reduced considerably during the first quarter and it seems that a resumption of Federal spending for public works is the only thing which can add materially to construction activity.

THE emergency increase in freight rates granted to the railroads by the Interstate Commerce Commission may have an immediate effect on steel activity. Advances of 2c. a 100 lb. on certain forms of finished steel and a similar amount on pig iron will unquestionably lead to some consumer covering. Of even more importance to the steel industry, however, will be the freight increases on raw materials. In some districts, higher freight tariffs on iron ore, coal and coke will increase pig iron making costs from 50c. to \$1 a ton, and under the industry's code this burden cannot be passed along to the consumer before the third quarter.

The effects of the higher rates on the carriers' purchases cannot yet be ascertained. Most of the added revenue will be offset by the 5 per cent increase in wages which the railroads restored on April 1. It is not considered likely that the steel industry will benefit by increased orders for rolling stocks and track materials as an immediate result of the freight rate advance.

DESPITE the possibility of increased steel quotations as a result of higher freight rates, the finished steel price structure has suffered its first major setback since last July. Cold-finished steel bars have been marked down \$3 a ton at all basing points, effective April 11. The decline was due entirely to the competitive situation in the automotive industry. As a Detroit mill was the first to file the reduction, the growing importance of that city as a steel-making center was emphasized.

The steady decline in scrap quotations which has been under way for several weeks has been temporarily checked, and THE IRON AGE composite price is unchanged at \$10.75 a ton. The pig iron and finished steel composites are holding at \$17.90 a ton and 2.124c. a lb. respectively.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

Per Gross Ton:	Apr. 2, 1935	Mar. 26, 1935	Mar. 5, 1935	Apr. 3, 1934
No. 2 fdy., Philadelphia.....	\$20.26	\$20.26	\$20.26	\$19.26
No. 2, Valley furnace.....	18.50	18.50	18.50	17.50
No. 2 Southern, Cin'ti.....	19.13	19.13	19.13	18.13
No. 2, Birmingham†.....	14.50	14.50	14.50	13.50
No. 2 foundry, Chicago*.....	18.50	18.50	18.50	17.50
Basic, del'd eastern Pa.....	19.76	19.76	19.76	18.76
Basic, Valley furnace.....	18.00	18.00	18.00	17.00
Valley Bessemer, del'd P'gh.....	20.76	20.76	20.76	19.76
Malleable, Chicago*.....	18.50	18.50	18.50	17.50
Malleable, Valley.....	18.50	18.50	18.50	17.50
L. S. charcoal, Chicago.....	24.04	24.04	24.04	23.54
Ferromanganese, seab'd carlots.....	85.00	85.00	85.00	85.00

†This quotation is for delivery in South; in the North prices are 35c. a ton under delivered quotations from nearest Northern furnace.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Rails, Billets, etc.

Per Gross Ton:	Apr. 2, 1935	Mar. 26, 1935	Mar. 5, 1935	Apr. 3, 1934
Rails, heavy, at mill.....	\$36.37 1/2	\$36.37 1/2	\$36.37 1/2	\$36.37 1/2
Light rails, Pittsburgh.....	35.00	35.00	35.00	32.00
Rerolling billets, Pittsburgh.....	27.00	27.00	27.00	26.00
Sheet bars, Pittsburgh.....	28.00	28.00	28.00	26.00
Slabs, Pittsburgh.....	27.00	27.00	27.00	26.00
Forging billets, Pittsburgh.....	32.00	32.00	32.00	31.00
Wire rods, Pittsburgh.....	38.00	38.00	38.00	36.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.....	1.70	1.70	1.70	1.60

Finished Steel

Per Lb.	Cents	Cents	Cents	Cents
Bars, Pittsburgh.....	1.80	1.80	1.80	1.75
Bars, Chicago.....	1.85	1.85	1.85	1.80
Bars, Cleveland.....	1.85	1.85	1.85	1.80
Bars, New York.....	2.13	2.13	2.13	2.08
Plates, Pittsburgh.....	1.80	1.80	1.80	1.70
Plates, Chicago.....	1.85	1.85	1.85	1.75
Plates, New York.....	2.08	2.08	2.08	1.98
Structural shapes, Pittsburgh.....	1.80	1.80	1.80	1.70
Structural shapes, Chicago.....	1.85	1.85	1.85	1.75
Structural shapes, New York.....	2.05 1/4	2.05 1/4	2.05 1/4	1.95 1/4
Cold-finished bars, Pittsburgh.....	2.10	2.10	2.10	2.10
Hot-rolled strips, Pittsburgh.....	1.85	1.85	1.85	1.75
Cold-rolled strips, Pittsburgh.....	2.60	2.60	2.60	2.40

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables. †Blue Eagle copper.

Finished Steel

Per Lb.	Apr. 2, 1935	Mar. 26, 1935	Mar. 5, 1935	Apr. 3, 1934
Hot-rolled annealed sheets, No. 24, Pittsburgh.....	2.40	2.40	2.40	2.25
Hot-rolled annealed sheets, No. 24, Gary.....	2.50	2.50	2.50	2.35
Sheets, galv., No. 24, P'gh.....	3.10	3.10	3.10	2.85
Sheets, galv., No. 24, Gary.....	3.20	3.20	3.20	2.95
Hot-rolled sheets, No. 10, P'gh.....	1.85	1.85	1.85	1.75
Hot-rolled sheets, No. 10, Gary.....	1.95	1.95	1.95	1.85
Wire nails, Pittsburgh.....	2.60	2.60	2.60	2.35
Wire nails, Chicago dist. mill.....	2.65	2.65	2.65	2.40
Plain wire, Pittsburgh.....	2.30	2.30	2.30	2.20
Plain wire, Chicago dist. mill.....	2.35	2.35	2.35	2.25
Barbed wire, galv., Pittsburgh.....	3.00	3.00	3.00	2.85
Barbed wire, galv., Chicago dist. mill.....	3.05	3.05	3.05	2.90
Tin plate, 100 lb. box, P'gh.....	\$5.25	\$5.25	\$5.25	\$5.25

Scrap

Per Gross Ton:	Apr. 2, 1935	Mar. 26, 1935	Mar. 5, 1935	Apr. 3, 1934
Heavy melting steel, P'gh.....	\$11.75	\$11.75	\$12.75	\$14.25
Heavy melting steel, Phila.....	10.25	10.25	11.00	11.75
Heavy melting steel, Ch'go.....	10.25	10.25	10.75	11.75
Carwheels, Chicago.....	10.50	10.50	11.00	11.75
Carwheels, Philadelphia.....	11.25	11.75	12.50	13.00
No. 1 cast, Pittsburgh.....	12.25	12.25	13.25	13.75
No. 1 cast, Philadelphia.....	11.00	11.00	11.00	13.25
No. 1 cast, Ch'go (net ton).....	9.00	9.00	9.50	9.50
No. 1 RR. wrot., Phila.....	10.75	10.75	11.00	11.00
No. 1 RR. wrot., Ch'go (net).....	8.00	8.00	8.75	9.50

Coke, Connellsville

Per Net Ton at Oven:	Apr. 2, 1935	Mar. 26, 1935	Mar. 5, 1935	Apr. 3, 1934
Furnace coke, prompt.....	\$3.85	\$3.85	\$3.85	\$3.85
Foundry coke, prompt.....	4.60	4.60	4.60	4.60

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, refinery.....	8.75	8.75	8.75	7.75
Lake copper, New York.....	9.12 1/2	9.12 1/2	9.12 1/2	8.00
Tin (Strait), New York.....	48.00	47.45	47.37 1/2	55.50
Zinc, East St. Louis.....	3.90	3.90	3.90	4.30
Zinc, New York.....	4.25	4.25	4.25	4.65
Lead, St. Louis.....	3.50	3.45	3.40	3.90
Lead, New York.....	3.65	3.60	3.55	4.00
Antimony (Asiatic), N. Y.....	14.50	14.50	14.50	7.60

The Iron Age Composite Prices

Finished Steel

April 2, 1935
One week ago
One month ago
One year ago

2.124c. a Lb.
2.124c.
2.124c.
2.008c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products make 85 per cent of the United States output.

	High	Low
1935.....	2.124c., Jan. 8;	2.124c., Jan. 8
1934.....	2.199c., April 24;	2.008c., Jan. 2
1933.....	2.015c., Oct. 3;	1.867c., April 18
1932.....	1.977c., Oct. 4;	1.926c., Feb. 2
1931.....	2.037c., Jan. 13;	1.945c., Dec. 29
1930.....	2.273c., Jan. 7;	2.018c., Dec. 9
1929.....	2.317c., April 2;	2.273c., Oct. 29
1928.....	2.286c., Dec. 11;	2.217c., July 17
1927.....	2.402c., Jan. 4;	2.212c., Nov. 1

Pig Iron

\$17.90 a Gross Ton
17.90
17.90
16.90

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High	Low
1935, Jan. 8;	\$17.90, Jan. 8;	\$17.90, Jan. 8
17.90, May 1;	16.90, Jan. 27	
16.90, Dec. 5;	13.56, Jan. 3	
14.81, Jan. 5;	13.56, Dec. 6	
15.90, Jan. 6;	14.79, Dec. 15	
18.21, Jan. 7;	15.90, Dec. 16	
18.71, May 14;	18.21, Dec. 17	
18.59, Nov. 27;	17.04, July 24	
19.71, Jan. 4;	17.54, Nov. 1	

Steel Scrap

\$10.75 a Gross Ton
10.75
11.50
12.58

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	High	Low
1935, Jan. 8;	\$12.33, Jan. 8;	\$10.75, Mar. 26
13.00, Mar. 13;	9.50, Sept. 25	
12.25, Aug. 8;	6.75, Jan. 3	
8.50, Jan. 12;	6.42, July 6	
11.33, Jan. 6;	8.50, Dec. 29	
15.00, Feb. 18;	11.25, Dec. 9	
17.58, Jan. 29;	14.08, Dec. 3	
16.50, Dec. 31;	13.08, July 2	
15.25, Jan. 11;	13.08, Nov. 27	

Pittsburgh District Output Holding at 35 Per Cent



Production in Valleys Declines to 50 Per Cent As Wheeling Activity Is Sustained—Cold-Finished Bar Prices Reduced \$3 a Ton

PITTSBURGH, April 2.—A mixed array of influences is keeping steel activity in this district in a rather uncertain position. Temporary respite from labor difficulties in the bituminous coal industry, a well-sustained flow of miscellaneous steel orders for spot delivery, and the approach of the spring season are tending to forestall a marked recession in mill activity for the time being.

On the more unfavorable side is the continued unsettlement growing out of pending legislation and harassing political investigations, the approaching expiration of the present recovery experiment and the important question regarding the fate of the iron and steel code.

Of more specific interest to steel producers in the last-named connection is the probable course of finished steel prices. A general reduction of \$3 a ton on cold finished bars, to become effective April 11, already has created an unsettling effect on steel quotations. With consumers already timid about ordering steel in the face of indefinite prospects, a weakening of price structure will tend to accentuate cautious buying policies. At the moment there is no indication that the reduction in cold finished bars will spread to other finishes of steel. Cold finished producers had been expecting a renewed automotive demand early in April, but motor car makers now will probably defer further placements until the lower prices are established.

Finishing units have not effected any notable changes in rolling schedules, with sheet mills and strip mills holding at 65 and 50 per cent respectively. Production for the wire industry is estimated at 50 per cent, with local mills averaging 40 per cent. Tin plate operations this week are slightly off at 85 to 90 per cent.

Raw steel production in the Pittsburgh district is steady at 35 per cent, but some producers expect to reduce output slightly within the next fortnight. Operations in the Valleys and nearby northern Ohio mills are down five

points to 50 per cent, while in the Wheeling district activity is fairly well sustained at 85 per cent.

Pig Iron

March bookings slightly exceeded February volume. Furnace backlogs at the outset of second quarter are virtually non-existent, and new orders are not being placed with noticeable freedom. Except in reciprocal arrangements, covering is being restricted to early melting requirements. A tapering in foundry melt in this district is expected late in April. Weakness in the scrap market is not helping the cause of pig iron sellers, and so long as an abnormal spread between old material and virgin metal prices exists, consumers will lean toward heavier charges of scrap.

Semi-Finished Steel

The pace in this market still is being set by sheet bars for tin plate conversion. The movement of sheet bars, slabs and billets to non-integrated sheet and strip mills continues to narrow slightly. With most detached mills gaging their semi-finished steel purchases as closely as finished steel consumers, some improvement in this market may accompany an expected temporary revival in shipments of finished steel to the automotive industry for second quarter assemblies. In few instances have non-integrated mills built up stocks for second quarter. A fair movement in skelp continues. Wire rods are enjoying a seasonal spurt in activity among wire mills.

Bolts, Nuts and Rivets

Discounts on bolts and nuts are now established uniformly at 70, 10 and 5. Specifying just prior to the close of March against first quarter contracts committed at the old lower prices picked up moderately, but consumers generally are cautious about stocking. It is difficult to discern any specific trend in demand in consuming industries. The railroads and automotive industry are taking the bulk of current shipments. Building

construction and ship work are not adding a great deal to current activity.

Rails and Track Accessories

Inquiry reaching this district reflects little prospective buying of major importance by the carriers. The local rail mill has no backlog tonnage on which to base steady engagement, nor are producers of track accessories able to maintain regular output. The granting of increased freight rates to the carriers, to remain in effect until June, 1936, is not expected to be reflected immediately in railroad purchases of materials and equipment, as part of the increased revenue will be used for restoring a wage cut and to ease over-taxed treasuries.

Reinforcing Steel

Although incoming business in March was heavier than that in February, the rate of improvement in recent weeks has not kept pace with usual seasonal expansion. Plans for extensive spring road programs still are bunkered by the pending Federal relief works bill. Jobbers are appearing more frequently, but are ordering only against actual ultimate reinforcement needs. Rail steel is being specified for various construction projects grouped in the Muskingum Valley Conservancy District.

Cold-Finished Bars

March bookings did not measure up to February tonnage, owing largely to the lack of buying last month by the automotive industry, which had covered early in the quarter for February-March requirements. Cold-finishers still are pointing to an expected renewal of buying for automotive consumption in May and June, and believe heavier placements will appear within the next 10 days. Demand from miscellaneous sources is lighter. Farm implement makers are beginning to exercise greater caution in ordering ahead. Jobbers are disappointingly quiet.

A general reduction of \$3 a ton, effective on all shipments after April 10 has been announced. The new base at Pittsburgh after that date will be 1.95c.

Plates and Shapes

While a substantial tonnage of plates for barge construction pends, the current flow of orders is rather thin. Miscellaneous requirements, including plates for repair work, make up the bulk of present demand. The railroads and ship builders are not at the moment adding a great deal to mill order books.

The structural steel market re-

mains a quiet affair, with inquiries and awards lacking feature tonnage. Building projects in the offing are indefinite. Private construction emerges only occasionally from a general state of inertia, while public works building in the aggregate is running too small to offset declining backlogs at most structural mills.

Tubular Products

Production in the Pittsburgh district is tending lower, with operations at a leading mill temporarily suspended. Other producers are maintaining output at around 33 1/3 to 40 per cent of theoretical capacity. The character of incoming tonnage lacks assurance of any notable improvement for the next month or two. The extensive drilling programs discussed by the oil industry late in 1934 have not yet materialized. It is evident that oil company managements are measuring expenditures closely, and the allocation of funds for necessarily deeper drilling have not yet permitted the following of the ambitious plans for 1935. Smaller diameter tubular goods are moving in unchanged volume.

Bars

Demand shows little change. At least a temporary upturn in orders still is expected from the automotive industry, which is believed to have liquidated its steel stocks to a point where replenishments for second quarter assemblies are necessary. The movement of bars to the farm implement makers is not so brisk. Miscellaneous consumers are sustaining their takings.

Wire Products

Seasonal betterment in demand is appearing, but consumers are displaying more caution than usual at this season in placing orders. The lion's share of incoming tonnage originates in the farm regions. Demand for manufacturers' wire is tapering, but this trend may be reversed if an expected renewal of automotive buying materializes this month. Jobbers are not covering with unusual freedom, but are more inclined to piece out stocks depleted by seasonal movement. Operations for the wire industry are estimated at 50 per cent, with mills in the Pittsburgh district not faring much better than 40 per cent.

Sheets

While miscellaneous specifications held their own in the past week, scattered improvement in orders from the automotive industry provided a moderate lift in aggregate sheet tonnage. In some

instances, mill backlogs will carry the present rate of operations through April. Average production for the sheet industry this week is expected to hold the recent estimate of 65 per cent. General advances of \$2 to \$9 a ton on secondary sheets, representing off grade and rejected sheets, became effective on April 1. The effect of the advances probably will be to divert some of the demand for "seconds," which have been popular in some consuming industries because of the price inducements, back to prime sheets.

Tin Plate

A contraction in aggregate specifications in the past week was the first setback reported in this market in many weeks. The slump is not seriously considered, however, in view of the recent unusually heavy flow of releases. Tin plate production for the industry this week will probably average between 85 and 90 per cent. Sharp fluctuations from the present rate are not expected, as tin plate consumption probably will not reach a peak until June.

Strip Steel

Orders from parts makers increased in the past week, but no noticeable improvement has appeared from motor car manufacturers. Increased specifications are expected for Chevrolet requirements this week, and a general improvement in automotive needs is believed assured before mid-April. A steady demand continues from manufacturers of electric stoves, refrigerators, shelving and chairs. Agricultural implement makers are beginning to order hesitatingly. Production for the strip industry this week will probably hold at 50 per cent.

Coal and Coke

A reaction in bituminous production and demand has set in since the wage agreement was extended until June 16, when final disposition of union demands for higher wages and shorter working week will be disposed of for the new "coal year." Most consumers are fairly well stocked with bituminous coal, which had reached an abnormally high movement in the final week in March in anticipation of the threatened suspension of operations. Although shipments probably will decline rather markedly, a fairly good movement still is in prospect for Lake shipment. With the union demands still not settled, the strike contingency in June may continue to keep consumer interest alive until further negotiations bring a more definite result. A stocking movement of coke on a much lesser

scale prior to the threatened bituminous strike, has placed consumers in a rather comfortable position for 30 to 60 days.

Scrap

Consumer interest has largely evaporated, and the lifting of suspensions at one or two points represents the only immediate encouraging feature in this district. In the absence of active market influences, the entire scrap list remains quotably unchanged. In support of the current quotational spread of \$11.50 to \$12, delivered, for No. 1 heavy melting steel is the reported disposition of that grade on the recent Baltimore & Ohio list at around \$12 delivered to a local mill. The closing of several other railroad scrap lists on April 3, including the Pennsylvania, Wabash, New York Central and Erie lists, will undoubtedly provide a clearer picture of price trends.

Steel Demand Is Fair At St. Louis

ST. LOUIS, April 2.—Demand for finished iron and steel is marking time with some business being transacted but no large orders reported. The movement of barbed wire and galvanized roofing to the farm areas is said to be good. A falling off in inquiries for structural steel is noticed. Warehouses are said to be buying sparingly of all items from the mills.

The Board of Education has rejected all bids for the Southwest High School, requiring 480 tons of reinforcing bars and 250 tons of structural, and new bids for a smaller building will be asked in September. Mississippi Valley Structural Steel Co. has been awarded 100 tons for a warehouse at Jefferson Barracks. Fabricators of structurals are operating at about 25 per cent of capacity, although two of the seven plants included in the estimate are operating at about 75 per cent.

While shipments of pig iron during the first half of March were approximately at the same daily average rate as in February, a slight improvement occurred toward the end of the month, and the month will show an increase over February. This will mark the eighth consecutive month of rising shipments of this commodity.

The scrap iron market is reported weaker, due to a lack of buying by mills in the district which are said to be well fortified with reserve stocks of raw materials. Little distress scrap is reported.

Chicago Steel Production Rises Above 50 Per Cent



Sharp Gain of 3½ Points Occurs in
Spite of Slight Decline in Bookings—
22,500 Tons of Reinforcing Bars Pending in Large Projects

CHICAGO, April 2.—Ingot production in the Chicago district has advanced 3½ points to 50½ per cent of capacity. Finished steel bookings are not as large as a week ago, but they are still above the average to date this year in terms of both sales and specifications.

The automobile industry, which last week turned out its millionth car for the year, is maintaining its operations and still expects to produce a total of 3½ million units before Dec. 31. Motor car makers, however, are taking less steel than they were taking several weeks ago. Their reduced releases are probably due in part to an accumulation of stocks more in keeping with operations, but are also attributable to uncertainty regarding the fate of the code, agitation for additional basing points and the possibility of labor trouble.

These same factors have resulted in a more cautious attitude on the part of other groups of steel buyers. Apparently there is no movement under way as yet to build up steel stocks in anticipation of the freight rate advances.

The order of the Interstate Commerce Commission was vague in certain particulars and it will probably take a week or two before precise information as to the extent of rate advances on finished steel will be known. It is unlikely, however, that the increases will be large enough to warrant anticipatory covering.

Blast furnace operations are unchanged, with 15 steel company stacks active out of a total of 36.

Pig Iron and Coke

Higher prices on both pig iron and foundry coke are in prospect as a result of the order of the Interstate Commerce Commission authorizing emergency freight rate increases. Though no official information has yet been given out as to the extent of the rate in-

creases or as to their effective date, it is estimated that the cost of making pig iron in this district will be raised 50c. to \$1 a ton. Increases in coal and coke rates are identical and are on a sliding scale as follows: 3c. added on freight rates of 75c. a net ton or under, 5c. added on rates of 76c. to \$1, 10c. added on rates of \$1.01 to \$1.50, and 15c. added on rates of \$1.51 and over. Rail rates on ore and limestone will also be higher.

Lake producers of pig iron charge discrimination because the advance on ore rates for rail-lake hauls is proportionately higher than for rail-lake-rail hauls. Pig iron rates will be advanced a flat 7 per cent on all hauls. Consumers of both pig iron and coke are likely to lay in stocks both in anticipation of the rate increases and possible price advances. While such buying is not healthy from an economic point of view, it will have a stimulating effect on trade at a time when business sentiment is wavering. Stocking of coke, of course, will be on a much more limited scale than stocking of pig iron.

March pig iron shipments in this district were 19 per cent larger than in February. Foundry coke shipments ran 18 per cent ahead of those of February. Deliveries of pig iron to tractor manufacturers continue to increase. If farm implement manufacturers are entering a seasonal decline, as is reported elsewhere, that fact has not yet been reflected in pig iron deliveries, which are well maintained. Shipments to automotive foundries are also undiminished. The leading merchant interest has three furnaces active out of a total of nine. Included among the producing stacks are one local furnace and two at Toledo. Pig iron contract tonnage booked in March was 40 per cent larger than contract bookings in December, the

comparable month preceding the first quarter.

Cast Iron Pipe

Considerable quantities of miscellaneous fittings for the sanitary districts of Chicago and Indianapolis have come up for bids within the past week. Inquiry for straight pipe is light. Madison, Wis., will take bids April 3 on 2000 ft. of 8 to 20-in. Class A.

Plates

Miscellaneous demand for plates and shapes from the railroads has improved, but the tonnage involved does not run into big figures. Little car repair work is being done and no car buying is reported. The Burlington, however, intends to go ahead with the construction of 750 cars in its own shops some time in June. Plans call for the building of 250 hopper cars and 500 gondolas. But complete details as to design and materials have not yet been worked out.

Structural Material

Complete plans are ready for three dams to be constructed on the upper Mississippi River near the Twin Cities and for four dams for down river points. Hence awards can be made as soon as funds become available under the recent public works appropriation. Public projects predominate in current fabricating awards and inquiries. Lettings, including small miscellaneous jobs, total 5350 tons, and new projects aggregate 4215 tons.

Reinforcing Steel

Four large pending projects which may be placed within the next fortnight total 22,500 tons. Included are 11,000 tons for the spillway of the Fort Peck, Mont., dam, 6000 tons for the Stickney, Ill., project of the Chicago Sanitary District, 2000 tons for the Alton, Ill., dam and 3500 tons for the Milwaukee filter plant. Current awards of 1100 tons include 900 tons for the Hammond, Ind., filter plant. New projects total 1000 tons.

Bars

Demand from the automotive industry, though still large, is tapering. Tractor manufacturers continue to take steel in undiminished volume, and road machinery makers, who are increasing their schedules in preparation for the road building season, are larger buyers. Farm implement production is undergoing a seasonal decline. Tractor and implement

(CONCLUDED ON PAGE 67)

Prices of Finished Steel and Iron Products

BARS, PLATES, SHAPES

Iron and Steel Bars	
Soft Steel	
	Base per Lb.
F.o.b. Pittsburgh	1.80c
F.o.b. Chicago	1.85c
F.o.b. Gary	1.85c
F.o.b. Duluth	1.95c
F.o.b. Cleveland	1.95c
F.o.b. Buffalo	1.95c
F.o.b. Philadelphia	2.00c
F.o.b. New York	2.13c
F.o.b. Birmingham	1.95c
F.o.b. cars dock Gulf ports	2.20c
F.o.b. cars dock Pacific ports	2.35c

Roll Steel	
(For merchant trade)	
F.o.b. Pittsburgh	1.70c
F.o.b. Chicago	1.75c
F.o.b. Gary	1.75c
F.o.b. Moline, Ill.	1.75c
F.o.b. Cleveland	1.80c
F.o.b. Birmingham	1.85c
F.o.b. cars dock Gulf ports	2.10c
F.o.b. cars dock Pacific ports	2.25c

Billet Steel Reinforcing	
(Straight lengths as quoted by distributors)	
F.o.b. Pittsburgh	2.05c
F.o.b. Chicago	2.10c
F.o.b. Gary	2.10c
F.o.b. Detroit	2.20c
F.o.b. Cleveland	2.10c
F.o.b. Youngstown	2.10c
F.o.b. Buffalo	2.10c
F.o.b. Birmingham	2.10c
F.o.b. cars dock Gulf ports	2.45c
F.o.b. cars dock Pacific ports	2.45c

Rail Steel Reinforcing	
(Straight lengths as quoted by distributors)	
F.o.b. Pittsburgh	1.90c
F.o.b. Chicago	1.95c
F.o.b. Gary	1.95c
F.o.b. Cleveland	1.95c
F.o.b. Youngstown	1.95c
F.o.b. Buffalo	1.95c
F.o.b. Birmingham	1.95c
F.o.b. cars dock Gulf ports	2.30c
F.o.b. cars dock Pacific ports	2.30c

Iron	
F.o.b. Chicago	1.80c
F.o.b. Terre Haute, Ind.	1.75c
F.o.b. Louisville, Ky.	1.80c
F.o.b. Danville, Pa.	1.80c
F.o.b. Berwick, Pa.	1.70c

Cold Finished Bars and Shafting*	
	Base per Lb.
F.o.b. Pittsburgh	2.10c
F.o.b. Chicago	2.15c
F.o.b. Gary	2.15c
F.o.b. Cleveland	2.15c
F.o.b. Buffalo	2.20c
F.o.b. Detroit	2.30c
F.o.b. eastern Michigan	2.35c

* In quantities of 10,000 to 19,000 lb.

Fence and Sign Posts	
Angle Line Posts	
	Base per Net Ton
F.o.b. Pittsburgh	\$50.00
F.o.b. Chicago	50.00
F.o.b. Duluth	50.00
F.o.b. Cleveland	50.00
F.o.b. Birmingham	53.00
F.o.b. Houston, Orange, Beaumont, Galveston	59.00
F.o.b. Mobile	58.00
F.o.b. New Orleans, Lake Charles, Corpus Christi	59.00
F.o.b. cars dock Pacific ports	63.00

Plates	
	Base per Lb.
F.o.b. Pittsburgh	1.80c
F.o.b. Chicago	1.85c
F.o.b. Gary	1.85c
F.o.b. Cleveland	1.95c
F.o.b. Coatesville	1.90c
F.o.b. Sparrow Point	1.95c
F.o.b. Philadelphia	1.95c
F.o.b. New York	2.08c
F.o.b. Birmingham	1.95c
F.o.b. cars dock Gulf ports	2.20c
F.o.b. cars dock Pacific ports	2.35c
Wrought iron plates, f.o.b. P'gh.	3.20c

Floor Plates	
F.o.b. Pittsburgh	3.35c
F.o.b. Chicago	3.40c
F.o.b. Coatesville	3.45c
F.o.b. cars dock Gulf ports	3.75c
F.o.b. cars dock Pacific ports	3.90c

Structural Shapes	
	Base per Lb.
F.o.b. Pittsburgh	1.80c
F.o.b. Chicago	1.85c
F.o.b. Cleveland	1.95c
F.o.b. Buffalo	1.90c
F.o.b. Bethlehem	1.90c
F.o.b. Philadelphia	2.00c
F.o.b. New York	2.05c
F.o.b. Birmingham (standard)	1.95c
F.o.b. cars dock Gulf ports	2.20c
F.o.b. cars dock Pacific ports	2.35c

Steel Sheet Piling

	Base per Lb.
F.o.b. Pittsburgh	2.15c
F.o.b. Chicago	2.25c
F.o.b. Buffalo	2.25c
F.o.b. cars dock Gulf ports	2.60c
F.o.b. cars dock Pacific ports	2.60c

SHEETS, STRIP, TIN PLATE

TERNE PLATE	
Sheets	
	Base per Lb.
No. 10, f.o.b. Pittsburgh	1.85c
No. 10, f.o.b. Gary	1.95c
No. 10, del'd Detroit	2.05c
No. 10, del'd Phila.	2.14c
No. 10, f.o.b. Birmingham	2.00c
No. 10, f.o.b. dock cars Pacific ports	2.40c

Hot-Rolled Annealed	
No. 24, f.o.b. Pittsburgh	2.40c
No. 24, f.o.b. Gary	2.50c
No. 24, del'd Detroit	2.60c
No. 24, del'd Phila.	2.69c
No. 24, f.o.b. Birmingham	2.55c
No. 24, f.o.b. dock cars Pacific ports	3.05c
No. 24, wrought iron, Pittsburgh	4.30c

Heavy Cold-Rolled	
No. 10 gage, f.o.b. Pittsburgh	2.50c
No. 10 gage, f.o.b. Gary	2.60c
No. 10 gage, del'd Detroit	2.70c
No. 10 gage, del'd Phila.	2.79c
No. 10 gage, f.o.b. Birmingham	2.65c
No. 10 gage, f.o.b. dock cars Pacific ports	3.10c

Light Cold-Rolled	
No. 20 gage, f.o.b. Pittsburgh	2.95c
No. 20 gage, f.o.b. Gary	3.05c
No. 20 gage, del'd Detroit	3.15c
No. 20 gage, del'd Phila.	3.24c
No. 20 gage, f.o.b. Birmingham	3.10c
No. 20 gage, f.o.b. dock cars Pacific ports	3.50c

Galvanized Sheets	
No. 24, f.o.b. Pittsburgh	3.10c
No. 24, f.o.b. Gary	3.20c
No. 24, del'd Phila.	3.29c
No. 24, f.o.b. Birmingham	3.25c
No. 24 f.o.b. dock cars Pacific ports	3.70c
No. 24, wrought iron, Pittsburgh	4.95c

Long Ternes	
No. 24, unassorted 8-lb. coating	3.40c
F.o.b. Pittsburgh	3.40c
F.o.b. cars dock Pacific ports	4.10c

Vitrous Enameling Stock	
No. 20, f.o.b. Pittsburgh	3.10c

Tin Mill Black Plate	
No. 28, f.o.b. Pittsburgh	2.75c
No. 28, Gary	2.85c
No. 28, cars dock, Pacific Coast	3.35c

Tin Plate	
	Per Base Box
Standard cokes, f.o.b. P'gh district mill	\$5.25
Standard cokes, f.o.b. Gary	5.35
Standard cokes, f.o.b. cars dock Pacific ports	5.90

Terne Plate	
(F.o.b. Pittsburgh)	
8-lb. coating (Per Package, 20 x 28 in.)	\$10.00
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.00
30-lb. coating I.C.	15.25
40-lb. coating I.C.	17.50

Hot-Rolled Hoops, Bands, Strips and Flats under 1/4 in.	
	Base per Lb.
All widths up to 24 in., P'gh.	1.85c
All widths up to 24 in., Chicago	1.95c
All widths up to 24 in., del'd Detroit	2.05c
All widths up to 24 in., Birmingham	2.00c
Cooperage stock, Pittsburgh	2.10c
Cooperage stock, Chicago	2.20c

Cold-Rolled Strips	
	Base per Lb.
F.o.b. Pittsburgh	2.60c
F.o.b. Cleveland	2.60c
F.o.b. Chicago	2.88c
F.o.b. Worcester	2.80c

Fender Stock	
No. 14, Pittsburgh or Cleveland	2.90c
No. 14, Worcester	3.30c
No. 20, Pittsburgh or Cleveland	3.30c
No. 20, Worcester	3.70c

Hot-Rolled Rail Steel Strips	
	Base per Lb.
F.o.b. Pittsburgh	1.70c
F.o.b. Chicago	1.75c
F.o.b. Birmingham	1.85c

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

To Manufacturing Trade	
	Per Lb.
Bright wire	2.30c
Spring wire	2.90c
Chicago prices on products sold to the manufacturing trade are \$1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are \$2 a ton above, Birmingham \$3 above, and Pacific Coast prices \$9 a ton above Pittsburgh or Cleveland.	

Qualified jobbers are entitled to a reduction of 20c. a 100 lb. from the base price on carload shipments to stock, and of 10c. a 100 lb. on less-carload shipments to stock.

Base per Keo	
Standard wire nails	\$2.60
Smooth coated nails	2.60
Galvanized nails:	
15 gage and coarser	4.60
16 gage and finer	5.10

Base per 100 Lb.	
Annealed fence wire	\$2.45
Galvanized fence wire	2.80
Polished staples	3.30
Galvanized staples	3.55
Barbed wire, galvanized	3.00
Woven wire fence, base column	63.00

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh); Duluth, Minn., and Worcester, Mass., mill prices are \$2 a ton over Pittsburgh (except for woven wire fence at Duluth which is \$3 over Pittsburgh), and Birmingham mill prices are \$3 a ton over Pittsburgh.

On wire nails, barbed wire, staples and fence wire, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are \$6 a ton over Pittsburgh, while Pacific Coast prices are \$8 over Pittsburgh. Reason: on fence wire Pacific Coast prices are \$11 a ton above Pittsburgh. On staples and barbed wire, prices of \$6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

Wire Hoops, Twisted or Welded

	OF List
F.o.b. Pittsburgh	35 and 2 1/2 off
F.o.b. Chicago	35 off

STEEL AND WROUGHT PIPE AND TUBING

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills
F.o.b. Pittsburgh only on wrought iron pipe.

Built Weld	
Steel	Wrought Iron
Inches	Inches
Black Galv.	Black Galv.
1/8 to 3/8	1/8 to 3/8
1/2 to 3/4	1/2 to 3/4
1 to 3	1 to 3
4 to 6	4 to 6
8 to 12	8 to 12
14 to 18	14 to 18
20 to 24	20 to 24
26 to 30	26 to 30
32 to 36	32 to 36
38 to 42	38 to 42
44 to 48	44 to 48
50 to 54	50 to 54
56 to 60	56 to 60
62 to 66	62 to 66
68 to 72	68 to 72
74 to 78	74 to 78
80 to 84	80 to 84
86 to 90	86 to 90
92 to 96	92 to 96
98 to 102	98 to 102
104 to 108	104 to 108
110 to 114	110 to 114
116 to 120	116 to 120
122 to 126	122 to 126
128 to 132	128 to 132
134 to 138	134 to 138
140 to 144	140 to 144
146 to 150	146 to 150
152 to 156	152 to 156
158 to 162	158 to 162
164 to 168	164 to 168
170 to 174	170 to 174
176 to 180	176 to 180
182 to 186	182 to 186
188 to 192	188 to 192
194 to 198	194 to 198
200 to 204	200 to 204
206 to 210	206 to 210
212 to 216	212 to 216
218 to 222	218 to 222
224 to 228	224 to 228
230 to 234	230 to 234
236 to 240	236 to 240
242 to 246	242 to 246
248 to 252	248 to 252
254 to 258	254 to 258
260 to 264	260 to 264
266 to 270	266 to 270
272 to 276	272 to 276
278 to 282	278 to 282
284 to 288	284 to 288
290 to 294	290 to 294
296 to 300	296 to 300
302 to 306	302 to 306
308 to 312	308 to 312
314 to 318	314 to 318
320 to 324	320 to 324
326 to 330	326 to 330
332 to 336	332 to 336
338 to 342	338 to 342
344 to 348	344 to 348
350 to 354	350 to 354
356 to 360	356 to 360
362 to 366	362 to 366
368 to 372	368 to 372
374 to 378	374 to 378
380 to 384	380 to 384
386 to 390	386 to 390
392 to 396	392 to 396
398 to 402	398 to 402
404 to 408	404 to 408
410 to 414	410 to 414
416 to 420	416 to 420
422 to 426	422 to 426
428 to 432	428 to 432
434 to 438	434 to 438
440 to 444	440 to 444
446 to 450	446 to 450
452 to 456	452 to 456
458 to 462	458 to 462
464 to 468	464 to 468
470 to 474	470 to 474
476 to 480	476 to 480
482 to 486	482 to 486
488 to 492	488 to 492
494 to 498	494 to 498
500 to 504	500 to 504
506 to 510	506 to 510
512 to 516	512 to 516
518 to 522	518 to 522
524 to 528	524 to 528
530 to 534	530 to 534
536 to 540	536 to 540
542 to 546	542 to 546
548 to 552	548 to 552
554 to 558	554 to 558
560 to 564	560 to 564
566 to 570	566 to 570
572 to 576	572 to 576
578 to 582	578 to 582
584 to 588	584 to 588
590 to 594	590 to 594
596 to 600	596 to 600
602 to 606	602 to 606
608 to 612	608 to 612
614 to 618	614 to 618
620 to 624	620 to 624
626 to 630	626 to 630
632 to 636	632 to 636
638 to 642	638 to 642
644 to 648	644 to 648
650 to 654	650 to 654
656 to 660	656 to 660
662 to 666	662 to 666
668 to 672	668 to 672
674 to 678	674 to 678
680 to 684	680 to 684
686 to 690	686 to 690
692 to 696	692 to 696
698 to 702	698 to 702
704 to 708	704 to 708
710 to 714	710 to 714
716 to 720	716 to 720
722 to 726	722 to 726
728 to 732	728 to 732
734 to 738	734 to 738
740 to 744	740 to 744
746 to 750	746 to 750
752 to 756	752 to 756
758 to 762	758 to 762
764 to 768	764 to 768
770 to 774	770 to 774
776 to 780	776 to 78

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
Machine bolts, 70, 10 and 5	
Carriage bolts, 70, 10 and 5	
Lag bolts, 70, 10 and 5	
Flange bolts, Nos. 1, 2, 3 and 7	
Hot-pressed nuts, blank or tapped, 70, 10 and 5	
Hot-pressed nuts, blank or tapped, 70, 10 and 5	
Hexagons, 70, 10 and 5	
C.p.c. and t. square or hex. nuts, 70, 10 and 5	
Semi-finished hexagon nuts, U.S.S., 70, 10 and 5	
Semi-finished hexagon nuts, S.A.E., 70, 10 and 5	
1/4 in. to 7/16 in. diameter, 70, 10 and 5	
1/2 in. to 1 in. diameter, 70, 10 and 5	
Larger than 1 in. diameter, 70, 10 and 5	
Store bolts in packages, Pittsburgh, 75	
Store bolts in packages, Cleveland, 75	
Store bolts in bulk, P.g.h., 83	
Store bolts in bulk, Chicago, 83	
Store bolts in bulk, Cleveland, 83	
Tire bolts, 60 and 5	

(1/4-in. and larger)
Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland, \$2.90
F.o.b. Chicago, 3.00
F.o.b. Birmingham, 3.05

Small Rivets
(7/16-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh, 70 and 5	
F.o.b. Cleveland, 70 and 5	
F.o.b. Chicago and Birm'g'm., 70 and 5	

Cap and Set Screws
(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws, 1 in. dia. and smaller, 80, 10 and 10	
Milled standard set screws, case hardened, 1 in. dia. and smaller, 75	
Milled headless set screws, cut thread, 1/4 in. and smaller, 75	
Upset hex. head cap screws, U.S.S.S. or S.A.E. thread, 1 in. dia. and smaller, 85	
Upset set screws, cut and oval point, 75 and 10 to 80	
Milled studs, 65 to 65 and 10	

Alloy and Stainless Steel

Alloy Steel Ingots
F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Uncropped, \$40 per gross ton

Alloy Steel Blooms, Billets and Slabs
F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Base price, \$40 a gross ton.

Alloy Steel Bars
Price del'd Detroit is \$52.
F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton, 2.45c.
Open-hearth grade, base, 2.60c.
Delivered price at Detroit is 2.60c.

Alloy Series
Numbers Differential per 100 lb.

2000 (2% Nickel)	0.25
2100 (2 1/2% Nickel)	0.55
2300 (3 1/2% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum) (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel, base	1.20
6100 Chromium Vanadium Bar	1.20
6100 Chromium Vanadium Spring Steel	0.70
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars is 1/4c. per lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

Alloy Cold-Finished Bars
F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 2.95c. base per lb.

STAINLESS STEEL No. 302
(17 to 19% Cr. 7 to 9% Ni. 0.08 to 0.20% C.)
(Base Prices, f.o.b. Pittsburgh)

	Per Lb.
Forging billets	19.55c.
Rolling slabs	15c.
Bars	25c.
Plates	25c.
Structural shapes	25c.
Sheets	33c.
Hot-rolled strip	20 1/2c.
Cold-rolled strip	27c.
Drawn wire	25c.

Raw and Semi-Finished Steel

Carbon Steel Re-rolling Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.
Uncropped, \$29 per gross ton

Carbon Steel Forging Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Birmingham.
Uncropped, \$31 per gross ton

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.
Per Gross Ton \$27.00
Forging quality 32.00

Delivered Detroit

Re-rolling \$30.00
Forging 35.00
Billets Only F.o.b. Duluth \$29.00
Forging 34.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.
Per Gross Ton \$28.00
Open-hearth or Bessemer

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.
Per Lb. 1.70c.
Universal 1.70c.
Sheared 1.70c.

Tube Rounds

Base per Lb.
F.o.b. Pittsburgh 1.80c.
F.o.b. Chicago 1.85c.
F.o.b. Cleveland 1.85c.
F.o.b. Buffalo 1.90c.
F.o.b. Birmingham 1.95c.

Wire Rods

(Common, base)

Per Gross Ton
F.o.b. Pittsburgh \$38.00
F.o.b. Cleveland 38.00
F.o.b. Chicago 39.00
F.o.b. Anderson, Ind. 39.00
F.o.b. Youngstown 39.00
F.o.b. Worcester, Mass. 40.00
F.o.b. Birmingham 41.00
F.o.b. San Francisco 47.00
F.o.b. Galveston 44.00

Pig Iron and Ferroalloys

PIG IRON

PRICES PER GROSS TON AT BASING POINTS

Basing Points	No. 2 Fdry.	Malleable	Base	Bessemer
Everett, Mass.	\$19.50	\$20.00	\$19.00	20.50
Bethlehem, Pa.	19.50	20.00	19.00	20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Swedeland, Pa.	19.50	20.00	19.00	20.50
Steelton, Pa.	19.50	20.00	19.00	20.50
Sparrows Point, Md.	19.50	20.00	19.00	20.50
Neville Island, Pa.	18.50	18.50	18.00	19.00
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Youngstown	18.50	18.50	18.00	19.00
Buffalo	18.50	19.00	17.50	19.50
Erie, Pa.	18.50	19.00	18.00	19.00
Cleveland	18.50	18.50	18.00	19.00
Toledo, Ohio	18.50	18.50	18.00	19.00
Jackson, Ohio	20.25	20.25	19.75	20.50
Detroit	18.50	18.50	18.00	19.00
Hamilton, Ohio	18.50	18.50	18.00	19.00
Chicago	18.50	18.50	18.00	19.00
Granite City, Ill.	18.50	18.50	18.00	19.00
Duluth, Minn.	19.00	19.00	18.50	19.50
Birmingham	14.50	14.50	13.50	19.00
Provo, Utah	17.50	17.50	17.00	18.00

DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

	No. 2 Fdry.	Malleable	Base	Bessemer
Boston Switching District				
From Everett, Mass.	\$20.00	\$20.50	\$19.50	\$21.00
Brooklyn				
From East. Pa. or Buffalo	21.77	22.27	21.27	22.77
Newark or Jersey City, N. J.				
From East. Pa. or Buffalo	20.89	21.39	20.39	21.89
Philadelphia				
From Eastern Pa.	20.26	20.76	19.76	21.26
Cincinnati				
From Hamilton, Ohio	19.51	19.51	19.01	20.01
Canton, Ohio				
From Cleveland and Youngstown	19.76	19.76	19.26	20.26
Columbus, Ohio				
From Hamilton, Ohio	20.50	20.50	19.50	20.50
Mansfield, Ohio				
From Cleveland and Toledo	20.26	20.26	19.26	20.26
Indianapolis				
From Hamilton, Ohio	20.77	20.77	19.77	20.77
South Bend, Ind.				
From Chicago	20.55	20.55	19.55	20.55
Milwaukee				
From Chicago	19.50	19.50	18.50	19.50
St. Paul				
From Duluth	20.94	20.94	19.94	20.94
Davenport, Iowa				
From Chicago	20.26	20.26	19.26	20.26
Kansas City				
From Granite City	21.04	21.04	20.04	21.04

Delivered prices on Southern iron for shipment to Northern points are 38c. a gross ton below delivered prices from the nearest Northern basing points.

LOW PHOSPHORUS PIG IRON

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y. \$23.50

GRAY FORGE PIG IRON

Valley furnace \$18.00
Pittsburgh district furnace 28.00

CHARCOAL PIG IRON

Lake Superior furnace \$21.00
Delivered Chicago 24.04
Delivered Buffalo 24.36

CANADA

Pig Iron

Per gross ton:

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75 \$31.00
No. 2 fdy., sil. 1.75 to 2.75 30.50
Malleable 31.90

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75 \$32.50
No. 2 fdy., sil. 1.75 to 2.25 32.00
Malleable 32.50
Basic 22.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.
Per Gross Ton
Domestic, 80% (carload) \$85.00

Spiegeleisen

Per Gross Ton Furnace
Domestic, 19 to 21% \$26.00

Electric Ferrosilicon

Per Gross Ton Delivered
50% (carloads) \$77.50
50% (ton lots) 85.00
75% (carloads) 126.00
75% (ton lots) 136.00

Silvery Iron

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton	Per Gross Ton
6% \$22.75	12% \$29.25
7% 23.75	13% 30.75
8% 24.75	14% 32.25
9% 25.75	15% 33.75
10% 26.75	16% 35.25
11% 27.75	17% 36.75

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton	Per Gross Ton
10% \$27.75	14% \$33.25
11% 28.75	15% 34.75
12% 30.25	16% 36.25
13% 31.75	17% 37.75

Manganese 1 1/4 to 3%, \$1 a ton additional. For each unit of manganese over 3%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 ton additional.

Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W, del., carloads, \$1.35 to \$1.45
Ferrotungsten, less carloads, 1.45 to 1.55
Ferrocromium, 4 to 6% carbon and up, 65 to 70% Cr. per lb. contained Cr. delivered, in carloads 10.00c.
Ferrocromium, 2% carbon 16.50c. to 17.00c.
Ferrocromium, 1% carbon 17.50c. to 18.00c.
Ferrocromium, 0.10% carbon 19.50c. to 20.00c.
Ferrocromium, 0.06% carbon 20.00c. to 20.50c.
Ferrocromium, del., per lb. contained V, \$2.70 to \$2.90
Ferrocobalt, 15 to 18% Ti, 6 to 8% C, f.o.b. furnace carload and contract per net ton \$137.50
Ferrophosphorus, electric, or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton with 2% unitage 50.00
Ferrophosphorus, electric, 24% f.o.b. Anniston, Ala., per gross ton with 2.75 unitage 65.00
Ferromolybdenum, per lb. Mo., del. 95c.
Calcium molybdate, per lb. Mo., del. 80c.
Silico spiegel, per ton, f.o.b. furnace, car lots 38.00
Ton lots or less per ton 45.50
Silico-manganese, gross ton, delivered: 2.50% carbon grade 90.00
2% carbon grade 95.00
1% carbon grade 105.00
Spot prices \$5 a ton higher

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$11.50 to \$12.00
No. 2 heavy melting steel	10.50 to 11.00
No. 2 railroad wrought	11.50 to 12.00
Scrap rails	12.25 to 12.75
Rails, 3 ft. and under	13.25 to 13.75
Compressed sheet steel	11.50 to 12.00
Hand bundled sheet steel	10.25 to 10.75
Hvy. steel axle turnings	10.00 to 10.50
Machine shop turnings	7.00 to 7.50
Short shov. turnings	7.00 to 7.50
Short mixed borings and turnings	6.00 to 6.50
Cast iron borings	6.00 to 6.50
Cast iron carwheels	12.25 to 12.75
Heavy breakable cast	11.00 to 11.50
No. 1 cast	12.00 to 12.50
Rail, knuckles and couplers	14.00 to 14.50
Rail, coil and leaf springs	14.00 to 14.50
Rolled steel wheels	14.00 to 14.50
Low phos. billet crops	14.50 to 15.00
Low phos. sheet bar crops	14.50 to 15.00
Low phos. plate scrap	14.00 to 14.50
Low phos. punchings	14.00 to 14.50
Steel car axles	14.50 to 15.00

CHICAGO

Delivered Chicago district consumers:	
	Per Gross Ton
Heavy melting steel	\$10.00 to \$10.50
Automobile hvy. melt. steel	9.50 to 10.00
Shoveling steel	10.00 to 10.50
Hydraulic comp. sheets	9.00 to 9.50
Drop forge flashings	8.50 to 9.00
No. 1 busheling	8.25 to 8.75
Rolled carwheels	11.00 to 11.50
Railroad tires	12.00 to 12.50
Railroad leaf springs	11.00 to 11.50
Axis turnings	9.00 to 9.50
Steel couplers and knuckles	11.00 to 11.50
Coil springs	12.00 to 12.50
Axis turnings (elec. fur.)	10.00 to 10.50
Low phos. punchings	12.00 to 12.50
Low phos. plates, 12 in. and under	12.50 to 13.00
Cast iron borings	5.50 to 6.00
Short shoveling turnings	5.50 to 6.00
Machine shop turnings	5.00 to 5.50
Rerolling rails	11.50 to 12.00
Steel rails, less than 3 ft.	12.50 to 13.00
Steel rails, less than 2 ft.	12.50 to 13.00
Angle bars, steel	11.25 to 11.75
Cast iron carwheels	10.50 to 11.00
Railroad malleable	13.00 to 13.50
Agricultural malleable	9.50 to 10.00

PHILADELPHIA

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$10.00 to \$10.50
No. 2 heavy melting steel	8.50 to 9.00
No. 1 railroad wrought	10.50 to 11.00
Bundled sheets	9.50 to 10.00
Hydraulic compressed, new	10.00 to 10.50
Hydraulic compressed, old	7.00 to 7.50
Machine shop turnings	6.00 to 6.50
Heavy axle turnings	8.50 to 9.00
Stove plate (steel work)	5.00 to 5.50
Heavy breakable cast	10.00 to 10.50
No. 1 low phos. heavy	14.50 to 15.00
Couplers and knuckles	13.50 to 14.00
Rolled steel wheels	13.50 to 14.00
No. 1 blast furnace	5.00 to 5.50
Spec. iron and steel pipe	8.00 to 8.50
Shafting	17.00 to 17.50
Steel axles	14.50 to 15.00
No. 1 forge fire	9.50 to 10.00
Cast iron carwheels	11.00 to 11.50
No. 1 cast	11.00 to 11.50
Cast borings (chem.)	12.00 to 12.50
Steel rails for rolling	12.00 to 12.50

CINCINNATI

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel	\$7.50 to \$8.00
No. 2 heavy melting steel	6.00 to 6.50
Scrap rails for melting	7.50 to 8.00
Loose sheet clippings	4.00 to 4.50
Bundled sheets	5.50 to 6.00
Cast iron borings	4.00 to 4.50
Machine shop turnings	4.00 to 4.50
No. 1 busheling	5.50 to 6.00
No. 2 busheling	2.25 to 2.75
Rails for rolling	5.50 to 6.00
No. 1 locomotive tires	6.75 to 7.25
Short rails	11.00 to 11.50
Cast iron carwheels	7.50 to 8.00
No. 1 machinery cast	8.75 to 9.25
No. 1 railroad cast	8.00 to 8.50
Burnt cast	5.50 to 6.00
Stove plate	5.50 to 6.00
Agricultural malleable	7.50 to 8.00
Railroad malleable	8.50 to 9.00

CLEVELAND

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$9.50 to \$10.00
No. 2 heavy melting steel	9.00 to 9.50
Compressed sheet steel	9.00 to 9.50
Light bundled sheet stampings	7.00 to 7.50
Drop forge flashings	8.50 to 9.00
Machine shop turnings	6.00 to 6.50
Short shoveling turnings	6.75 to 7.25
No. 1 busheling	9.00 to 9.50
Steel axle turnings	9.00 to 9.50
Low phos. billet crops	14.50 to 15.00
Cast iron borings	6.75 to 7.25
Mixed borings and short turnings	6.75 to 7.25
No. 2 busheling	6.75 to 7.25
No. 1 cast	12.00 to 12.50
Railroad grate bars	7.00 to 7.50
Stove plate	8.00 to 8.50
Rails under 3 ft.	14.50 to 15.00
Rails for rolling	15.50 to 16.00
Railroad malleable	13.00 to 13.50
Cast iron carwheels	12.00 to 12.50

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:	
No. 1 heavy melting steel	\$10.25 to \$10.75
No. 2 heavy melting scrap	8.75 to 9.25
Scrap rails	11.00 to 11.50
New hydraulic comp. sheets	8.75 to 9.25
Old hydraulic comp. sheets	7.75 to 8.25
Drop forge flashings	8.75 to 9.25
No. 1 busheling	8.75 to 9.25
Hvy. steel axle turnings	8.00 to 8.50
Machine shop turnings	4.50 to 5.00
Knuckles and couplers	11.50 to 12.00
Coil and leaf springs	11.50 to 12.00
Rolled steel wheels	11.50 to 12.00
Low phos. billet crops	12.00 to 12.50
Short short steel turnings	6.00 to 6.50
Short mixed borings and turnings	6.00 to 6.50
Cast iron borings	6.00 to 6.50
No. 2 busheling	6.50 to 7.00
Steel car axles	11.50 to 12.00
Iron axles	11.50 to 12.00
No. 1 machinery cast	11.00 to 11.50
No. 1 cupola cast	10.00 to 10.50
Stove plate	9.00 to 9.50
Steel rails, 3 ft. and under	12.50 to 13.00
Cast iron carwheels	8.00 to 8.50
Industrial malleable	12.00 to 13.00
Railroad malleable	12.00 to 13.00
Chemical borings	8.00 to 8.50

BOSTON

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel	\$8.25 to \$8.50
No. 1 heavy melting steel	5.75 to 6.25
Scrap T rails	8.00 to 8.50
No. 2 steel	7.25 to 7.50
No. 2 steel	5.25 to 5.75
Breakable cast	5.75 to 6.00
Machine shop turnings	1.50 to 1.75
Bundled skeleton, long	5.00 to 5.25
Forge flashings	5.00 to 5.25
Mixed borings and turnings	1.00 to 1.50
Shafting	12.00 to 12.50
Steel car axles	11.50 to 12.00
Cast iron borings, chemical	6.50 to 7.00
Stove plate	4.00 to 4.25

Per gross ton delivered consumers' yards:	
Textile cast	\$9.00 to \$9.50
No. 1 machinery cast	9.00 to 9.50
Stove plate	6.00 to 6.50
Railroad malleable	11.00 to 11.50

* Delivered local army base.

NEW YORK

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel	\$8.00 to \$8.50
No. 2 heavy melting steel	7.00 to 7.50
Heavy breakable cast	6.00 to 6.25
No. 1 machinery cast	7.50 to 8.00
No. 2 cast	6.50 to 7.00
Stove plate	6.00 to 6.50
Steel car axles	13.50 to 14.00
No. 1 railroad wrought	7.00 to 7.50
No. 1 yard wrought, long	6.00 to 6.50
Spec. iron and steel pipe	4.50 to 5.00
Forge fire	5.50 to 6.00
Rails for rolling	9.00 to 9.50
Short shoveling turnings	2.50 to 3.00
Machine shop turnings	2.50 to 3.00
Cast borings	3.50 to 3.75
No. 1 blast furnace	2.00 to 2.50
Cast borings (chemical)	11.00 to 11.50
Unprepared yard iron and steel	4.50 to 5.00

Per gross ton, delivered local foundries:	
No. 1 machinery cast	\$10.50
No. 1 hvy. cast (cupola size)	9.50
No. 2 cast	8.00

* For direct car loading only.

† Loading on barge.

BIRMINGHAM

Per gross ton delivered consumers' yards:	
Heavy melting steel	\$9.00 to \$9.50
Scrap steel rails	10.00 to 10.50
Short shoveling turnings	7.00 to 7.50
Stove plates	7.00 to 7.50
Steel axles	11.50 to 12.00
Iron axles	11.50 to 12.00
No. 1 railroad wrought	7.00 to 7.50
Rails for rolling	12.50 to 13.00
No. 1 cast	9.50 to 10.00
Tramcar wheels	10.00 to 10.50

ST. LOUIS

Per gross ton delivered consumers' yards:	
Selected heavy steel	\$8.50 to \$9.00
No. 1 heavy melting	8.00 to 8.50
No. 2 heavy melting	7.00 to 7.50
No. 1 locomotive tires	9.75 to 10.25
Misc. stand-sec. rails	9.25 to 9.50
Railroad spring	8.50 to 10.00
Bundled sheets	6.00 to 6.50
No. 2 railroad wrought	8.00 to 8.50
No. 1 busheling	5.00 to 5.50
Cast iron borings and shoveling turnings	3.75 to 4.25
Rails for rolling	10.00 to 10.50
Machine shop turnings	3.50 to 4.00
Heavy turnings	5.50 to 6.00
Steel car axles	12.50 to 13.00
Iron car axles	15.00 to 16.00
No. 1 railroad wrought	6.00 to 6.50
Steel rails less than 3 ft.	11.50 to 12.00
Steel angle bars	9.50 to 10.00
Cast iron carwheels	7.50 to 8.00
No. 1 machinery cast	8.50 to 9.00
Railroad malleable	9.50 to 10.00
No. 1 railroad cast	8.00 to 8.50
Stove plate	6.50 to 7.00
Agricult. malleable	8.50 to 9.00

DETROIT

Dealers' buying prices per gross ton:	
Heavy melting steel	\$7.50 to \$8.00
Borings and short turnings	4.25 to 4.75

ORES, FLUORSPAR, COKE, FUEL, REFRACTORIES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton	
Old range, Bessemer, 51.50% iron	\$4.80
Old range, non-Bessemer, 51.50% iron	4.65
Mesabi, Bessemer, 51.50% iron	4.65
Mesabi, non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore

C. & F. Philadelphia or Baltimore

Per Unit	
Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algerian	9.50c.
Iron, low phos., Swedish, average 68% iron	9.50c.
Iron, basic or foundry, Swedish, aver. 65% iron	9c.
Iron, basic or foundry, Russian, aver. 65% iron	9c.
Manganese, Caucasian, washed 51%	26c.
Manganese, African, Indian, 44-48%	21c.
Manganese, African, Indian, 49-51%	24c.
Manganese, Brazilian, 46 to 48%	20c.

Per Net Ton Unit	
Tungsten, Chinese, wolframite, duty paid, delivered*	\$17.50 to \$18.50
Tungsten, domestic scheelite, delivered†	17.00

Per Gross Ton	
Chrome, 45%, Cr ₂ O ₃ , crude, c.i.f. Atlantic Seaboard	\$17.00
Chrome, 48%, Cr ₂ O ₃ , c.i.f. Atlantic Seaboard	20.00

*Quotations nominal in absence of sales.
†Nominal; no supplies available.

Fluorspar

Per Net Ton	
Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines for all-rail shipment	\$13.00
Same grade for Ohio River barge shipment for Kentucky and Illinois River landings	16.00
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	14.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	19.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2% silicon, f.o.b. Illinois and Kentucky mines	30.00

COKE, COAL AND FUEL OIL

Coke

Per Net Ton	
Furnace, f.o.b. Connellsville	\$3.85
Foundry, f.o.b. Connellsville	4.80 to 5.10
Foundry, by-product, delivered in Chicago switching district	8.50
Foundry, by-product, delivered in Chicago switching district	9.25
Foundry, by-product, New England, delivered	11.00
Foundry, by-product, Newark or Jersey City, del'd	8.20 to 8.81
Foundry, by-product, Phila.	9.00

Long turnings	\$3.50 to \$4.00
No. 1 machinery cast	10.25 to 11.00
Automotive cast	10.75 to 11.50
Hydraulic comp. sheets	7.50 to 8.00
Stove plate	6.50 to 7.00
New factory busheling	6.50 to 7.00
Old No. 2 busheling	4.00 to 4.50
Sheet clippings	4.50 to 5.00
Flashings	7.25 to 7.75
Low phos. plate scrap	3.00 to 3.50

CANADA

Dealers' buying prices per gross ton:	
	Toronto Montreal
Heavy melting steel	\$7.00 \$7.50
Rails scrap	3.00 3.50
Machine shop turnings	3.00 3.50
Boiler plate	4.50 5.00
Heavy axle turnings	4.50 5.00
Cast borings	4.00 4.50
Steel borings	2.00 2.50
Wrought pipe	3.50 4.00
Steel axles	7.00 7.50
Axles, wrought iron	7.00 7.50
No. 1 machinery cast	8.00 8.50
Stove plate	5.50 6.00
Standard carwheels	7.25 7.75
Malleable	6.75 7.25

Foundry, by-product, Cleveland, delivered	
Foundry, Birmingham	8.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis	8.00

Coal	
	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	\$1.80 to \$2.10
Mine run coking coal, f.o.b. W. Pa. mines	2.05 to 2.15
Gas coal, 4 1/2-in., f.o.b. W. Pa. mines	2.25 to 2.35
Mine run gas coal, f.o.b. Pa. mines	2.05 to 2.15
Steam slack, f.o.b. W. Pa. mines	1.55 to 1.65
Gas slack, f.o.b. W. Pa. mines	1.90 to 2.10

Fuel Oil	
	Per Gal. f.o.b. Bayonne, N. J.
No. 3 distillate	4.00
No. 4 industrial	3.90

Per Gal. f.o.b. Baltimore	
No. 3 distillate	4.00
No. 4 industrial	3.90

REFRACTORIES

Fire Clay Brick

Per 1000 f.o.b. West	
	High-heat Intermediate Duty Brick
Pennsylvania	\$45.00
Maryland	46.00
New Jersey	55.00
Ohio	45.00
Kentucky	45.00
Missouri	45.00
Illinois	45.00
Ground fire clay, per ton	7.00

Silica Brick

Per 1000 f.o.b. West	
Pennsylvania	\$45.00
Chicago District	55.00
Birmingham	55.00
Silica clay, per net ton	8.00

Chrome Brick

Standard, f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	
Chemically Bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	\$45.00

Magnesite Brick

Standard, f.o.b. Baltimore and Chester, Pa.	
Chemically Bonded, f.o.b. Baltimore and Chester, Pa.	\$45.00

Grain Magnesite

Imported, f.o.b. Baltimore and Chester, Pa.	
Domestic, f.o.b. Baltimore and Chester	\$45.00
Domestic, f.o.b. Chewelah, Wash.	55.00

Warehouse Prices for Steel Products

PITTSBURGH

	Base per Lb.
Plates	3.15c
Structural shapes	3.15c
Soft steel bars and small shapes	3.90c
Reinforcing steel bars	2.90c
Cold-finished and screw stock:	
Rounds and hexagons	3.45c
Squares and flats	3.45c
Hoops and bands under 1/4 in.	3.20c
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.90c
Hot-rolled sheets (No. 10)	3.95c
Galv. corrug. sheets (No. 24), per square (more than 3750 lb.)	\$3.69
Spikes, large	2.90c
Track bolts, all sizes, per 100 count	65 per cent off list
Machine bolts, 100 counts	65 per cent off list
Carriage bolts, 100 count	65 per cent off list
Nuts, all styles, 100 count	65 per cent off list
Large rivets, base per 100 lb.	\$3.50
Wire, black, soft ann'd, base per 100 lb.	\$2.70
Wire, galv. soft, base per 100 lb.	\$2.925
Common wire nails, per keg	\$2.834
Cement coated nails, per keg	\$2.834

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lb.
*Delivered in Pittsburgh switching district.

NEW YORK

	Base per Lb.
Plates, 1/4 in. and heavier	3.40c
Structural shapes	3.37c
Soft steel bars, small shapes	3.22c
Iron bars, swed. charcoal	6.75c to 7.25c
Cold-fn. shafting and screw stock:	
Rounds and hexagons	3.92c
Flats and squares	4.42c
Cold-rolled; strip, soft and quarter hard	3.32c
Hoops	3.52c
Bands	3.52c
Hot-rolled sheets (No. 10)	3.37c
Hot-rolled ann'd sheets (No. 24*)	3.85c
Galvanized sheets (No. 24*)	4.50c
Long turn sheets (No. 24)	5.20c
Standard tool steel	11.00c
Wire, black annealed (No. 10)	3.25c
Wire, galv. (No. 10)	3.85c
Tire steel, 1 x 1/4 in. and larger	3.65c
Open hearth spring steel, 4.00c to 10.00c	
Common wire nails, base, per keg	\$3.21

	Per Cent Off List
Machine bolts, cut thread:	70
Carriage bolts, cut thread:	70
All diameters	70
Boiler tubes:	Per 100 Ft.
Lap welded, 2-in.	\$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	63.65

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.44c
Bars, soft steel or iron	3.19c
Cold-fn. rounds, shafting, screw	3.74c
stocks	4.09c
Hot-rolled annealed sheets (No. 24)	4.09c
Galv. sheets (No. 24)	4.64c
Hot-rolled sheets (No. 10)	3.29c
Black corrug. sheets (No. 24)	4.09c
*Galv. corrug. sheets (No. 24)	4.64c
Structural rivets	3.99c
Boiler rivets	4.09c

	Per Cent Off List
Tank rivets, 7/16 in. and smaller	55
Machine and carriage bolts, lag screws fittings up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts:	70
All quantities	70

*No. 26 and lighter take special prices.

PHILADELPHIA

	Base per Lb.
*Plates, 1/4-in. and heavier	2.95c
*Structural shapes	2.95c
*Soft steel bars, small shapes, iron bars (except bands)	2.90c
*Reinforcing steel bars, sq. twisted and deformed	2.955c
Cold-finished steel bars	3.73c
*Steel hoops	3.40c
*Steel bands, No. 12 and 3/16 in., incl.	3.15c
Spring steel	5.00c
Hot-rolled anneal. sheets (No. 24)	3.55c
*Galvanized sheets (No. 24)	4.25c
*Hot-rolled annealed sheets (No. 10)	3.95c
Diam. pat. floor plates, 1/4 in.	4.95c
Swedish iron bars	6.25c

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.
*Base prices subject to deduction on orders aggregating 4000 lb. or over.
†For 50 bundles or over.
‡For less than 2000 lb.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.31c
Soft steel bars	2.95c
Reinforce steel bars	2.10c
Cold-finished steel bars	3.40c
Flat-rolled steel under 1/4 in.	3.35c
Cold-finished strip	13.00c
Hot-rolled annealed sheets (No. 24)	3.96c
Galvanized sheets (No. 24)	4.61c
Hot-rolled sheets (No. 10)	3.11c
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.56c
Black ann'd wire, per 100 lb.	\$2.65
No. 9 galv. wire, per 100 lb.	3.00
Com. wire nails, base per keg	2.40

*Plus mill. size and quantity extras.
†Outside delivery 10c. less.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.40c
Bars, soft steel or iron	3.15c
New billet reinforce bars	3.25c
Rail steel reinforce bars	3.25c
Hoops and bands, 3/16 in. and lighter	3.45c
Cold-finished bars	3.75c
Hot-rolled annealed sheets (No. 24)	4.00c
Galv. sheets (No. 24)	4.70c
Hot-rolled sheets (No. 10)	3.25c
Structural rivets	4.35c
Small rivets	55 per cent off list
No. 9 ann'd wire, per 100 lb. (1000 lb. or over)	\$2.91
Com. wire nails, base per keg:	
1 to 24 kegs	3.50
25 to 50 kegs	3.30
Large quantities	3.10
Cement c'd nails, base 100-lb. keg	3.50
Chain, 1-in., per 100 lb.	8.35
Not per 100 Ft.	
Seamless steel boiler tubes, 2-in.	\$19.05
4-in.	44.96
Lap-welded steel boiler tubes, 2-in.	18.10
4-in.	42.32

BUFFALO

	Base per Lb.
Plates	3.37c
Struc. shapes	3.25c
Soft steel bars	3.00c
Reinforcing bars	2.60c
Cold-fn. flats and sq.	3.55c
Round and hex.	3.55c
Cold-rolled strip steel	3.19c
Hot-rolled annealed sheets (No. 24)	4.05c
Heavy hot-rolled sheets, 3/16 in., 24 to 48 in. wide	3.62c
Galv. sheets (No. 24)	4.70c
Bands	3.42c
Hoops	3.42c
Hot-rolled unannealed sheets	3.17c
Com. wire nails, base per keg	\$3.35
Black wire, base per 100 lb.	3.55

BOSTON

	Per Lb. Base
Beams, channels, angles, tees, zees	3.52c
H beams and shapes	3.52c
Plates—sheared, tank and univ. mill.	
1/4 in. thick and heavier	3.53c
Floor plates, diamond pattern	3.33c
Bar and bar shapes (mild steel)	3.30c
Bands 3/16 in. thick and	
No. 12 ga. incl.	3.60c to 4.60c
Half rounds, half ovals, ovals and bevels	4.55c
Tire steel	4.55c
Cold-finished rounds, squares and hexagons	4.90c
Hot-rolled strip steel	3.245c

Cold-finished flats	3.45c
Blue annealed sheets, No. 10 gal.	3.60c
One pass cold-rolled sheets No. 24 ga.	4.15c
Galvanized steel sheets, No. 24 ga.	4.85c
Lead coated sheets, No. 24 ga.	5.80c

Prices delivered by truck in metropolitan Boston, subject to quantity differentials.

MILWAUKEE

	Base per Lb.
Plates and structural shapes	3.31c
Soft steel bars	3.06c
Hot-rolled strip	3.41c
Hot-rolled sheets (No. 10)	3.16c
Hot-rolled annealed sheets (No. 24)	3.96c
Galvanized sheets (No. 24)	4.64c
Cold-finished steel bars	3.61c
Cold-rolled strip	3.30c
Structural rivets (keg lots)	3.85c
Boiler rivets (keg lots)	3.96c
Track spikes (keg lots)	3.71c
Track bolts (keg lots)	4.86c
Black annealed wire	3.10c
Com. wire nails	2.90c
Cement coated nails	2.94c
Machine bolts	70
Carriage bolts	70
Hot-pressed nuts, sq. and hex., tapped or blank (keg lots)	70

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 9999 lb. On cold-finished bars the prices are for orders of 300 to 499 lb.

PACIFIC COAST

	Base per Lb.
San Francisco	
Los Angeles	
Seattle	
Plates, tank and	
U. M.	3.55c
Shapes, standard	3.55c
Soft steel bars	3.60c
Reinforcing bars	3.60c
f.o.b. cars dock	
Pacific ports	2.45c
Hot-rolled annealed sheets (No. 24)	4.40c
Hot-rolled sheets (No. 10)	4.35c
Galv. sheets (No. 24)	3.75c
Galv. sheets (No. 10)	3.70c
Galv. sheets (No. 24)	5.00c
Galv. sheets (No. 10)	4.95c
Cold finished steel:	
Rounds	5.95c
Squares and hexagons	5.85c
Flats	6.04c
7.20c	7.10c
7.70c	7.60c
Common wire nails	
—base per keg	
less carload	\$3.30 \$3.40 \$3.30

All items subject to differentials for quantity.

TOOL STEEL

Prices are same for warehouse distribution at all points on or East of Mississippi River. West of Mississippi quotations are 1c. a lb. higher.

	Base per Lb.
High speed	57c
High carbon chrome	37c
Oil hardening	22c
Extra	17c
Regular	14c

Weekly Indications of Steel Activity

FROM THE IRON AGE

	Apr. 2, 1935	Mar. 26, 1935	Mar. 5, 1935	Apr. 3, 1934	Average Year to Date 1935	1934
Steel ingot operations—Per cent of capacity	47.0	46.5	48.5	48.5	49.3	41.1
	Apr. 2, 1935	Week Ended Mar. 26, 1935	Mar. 5, 1935	Apr. 3, 1934	Year to Date 1935	1934
Fabricated structural steel awards	8,300	17,600	9,300	8,150	179,513	209,015
Fabricated plate awards	1,520	1,800	2,800	450	24,105	29,332
Sheet steel piling awards	350	100	0	0	3,765	13,495
Reinforcing bar awards	1,735	5,710	1,575	5,225	56,935	56,525

Sales of Copper Exceed Normal Book —Lead Advances Five Points to 3.50c.

European Copper Producers Will Restrict Output; American Producers Will Cut Export Sales—Tin Advances to 48¢

NEW YORK, April 2—Consumers entered the electrolytic copper market on Friday and Saturday for about 5000 tons of metal. This rush of business served to lift total March bookings to about 32,300 tons, which was well over the book for the month and about 2800 tons over total February sales. Each seller received his quota during March and the excess served to wipe out part of the excessive accumulation of metal in this country. The Blue Eagle price list remains steadily at 9.12½c. for Lake metal delivered in the East and 8.75c. for electrolytic at the refinery. Likewise the market abroad continues in a firm position, with sizable sales each day at

7.30c. to 7.45c. a lb., delivered Continental base ports.

An official statement has finally clarified the copper curtailment discussions. Foreign producers will cut their output 240,000 tons annually, beginning June 1, 1935. Although a definite announcement has not been made as to the exports from this country, it is likely that they will be limited to about 8000 tons annually for both primary and secondary producers. An attempt will be made to put into effect uniform practices regarding sales, deliveries and terms of payment. However, there will be no pooling of sales or fixing of prices. Neither Russia nor Japan participated in the curtailment conference, but their absence will have

little effect inasmuch as both countries are normally copper importers.

Lead

At the present time consumer purchases are somewhat lighter than a week ago, as a natural reaction to the heavy orders entered at that time. The position of this commodity was so favorable last week that principal sellers advanced prices five points to 3.50c. a lb., St. Louis, and 3.65c., delivered New York. One producer is still so well booked that it is continuing to hold its offers at a level five points above the 3.65c., New York basis. No particular buying line is dominant in current transactions. April is almost completely sold and May is about 20 per cent covered. Most consumers are now specifying May delivery on new business.

Ingot Brass and Bronze

Combined shipments of ingot brass and bronze for the calendar month of January amounted to 5338 tons, as compared with 3688 tons in December. During the 28-day period ended March 22, the average prices paid for commercial 80-10-10 and commercial 85-5-5-5 were 9.880c. and 8.266c. respectively. In the preceding comparable period the corresponding figures were 9.786c. and 8.271c. respectively.

Tin

Even though the London market has strengthened and sterling has shown a tendency to advance, domestic consumers continue to restrict new purchases to occasional carlots. Evidently there is no great need for metal and consumers are delaying action in the hope that quotations may return to lower levels. During the week the dollar price of tin at New York steadily moved upward to today's level of 48c. a lb. London quotations on first call this morning were £216 15s. and £213 10s. for spot and future standard respectively, and £219 15s. for straits at Singapore.

Zinc

This metal is in an exceptionally firm position as the result of a 4000-ton decline in forward bookings last week and the strong position of the Joplin ore market. Spelter sales during the past seven-day period amounted to 1800 tons, as compared with 1600 tons in the preceding week and 2400 tons booked a fortnight ago. Sellers are none too willing to sell heavily at the current 3.90c. and 4.25c. price levels, and there is a belief in the market that a 4c. East St. Louis figure will be in effect in the near future.

The zinc industry will start

The Week's Prices. Cents Per Pound for Early Delivery

	Mar. 27	Mar. 28	Mar. 29	Mar. 30	April 1	April 2
Electrolytic copper, N. Y.*	8.75	8.75	8.75	8.75	8.75	8.75
Lake copper, N. Y.	9.12½	9.12½	9.12½	9.12½	9.12½	9.12½
Straits tin, Spot, New York	47.50	47.60	47.60	47.85	47.85	48.00
Zinc, East St. Louis	3.90	3.90	3.90	3.90	3.90	3.90
Zinc, New York	4.25	4.25	4.25	4.25	4.25	4.25
Lead, St. Louis	3.45	3.50	3.50	3.50	3.50	3.50
Lead, New York	3.60	3.65	3.65	3.65	3.65	3.65

*Refinery quotations; price ¼c. higher delivered in Connecticut.

Aluminum, virgin 99 per cent plus, 19c. to 22c. a lb., delivered.

Aluminum, remelt No. 12 (alloy), carload lots delivered, 14c. a lb., average for week.

Nickel, electrolytic, 35c. to 36c. a lb. base at refinery in lots of 2 tons or more.

Antimony, 14.50c. a lb., New York.

Brass ingots, 85-5-5-5, 8.25c. a lb., New York and Philadelphia.

From New York Warehouse

Delivered Prices, Base per Lb.	
Tin, Straits pig	49.50c. to 50.50c.
Tin, bar	51.50c. to 52.50c.
Copper, Lake	10.25c. to 11.00c.
Copper, electrolytic	10.00c. to 10.50c.
Copper, castings	9.75c. to 10.75c.
*Copper sheets, hot-rolled	16.00c.
*High brass sheets	14.25c.
*Seamless brass tubes	16.00c.
*Seamless copper tubes	16.25c.
*Brass rods	12.75c.
Zinc, slabs	5.75c. to 6.75c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	10.25c.
Lead, American pig	4.50c. to 5.50c.
Lead, bar	5.50c. to 6.50c.
Lead, sheets	7.25c.
Antimony, Asiatic	15.50c. to 16.50c.
Alum., virgin, 99 per cent, plus	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent	18.00c. to 19.00c.
Solder, ½ and ½	30.00c. to 31.00c.
Babbitt metal, commercial grades	25.00c. to 60.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.	
Tin, Straits pig	51.50c.
Tin, bar	53.50c.

Copper, Lake	10.00c.
Copper, electrolytic	10.00c.
Copper, castings	9.75c.
Zinc, slabs	5.50c. to 5.75c.
Lead, American pig	4.50c. to 4.75c.
Lead, bar	7.75c.
Antimony, Asiatic	16.50c.
Babbitt metal, medium grade	18.50c.
Babbitt metal, high grade	55.25c.
Solder, ½ and ½	31.00c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	5.75c.	6.50c.
Copper, hvy. and wire	5.62½c.	6.12½c.
Copper, light and bottoms	4.62½c.	5.12½c.
Brass, heavy	3.00c.	3.62½c.
Brass, light	2.25c.	3.00c.
Hvy. machine composition	4.62½c.	5.12½c.
No. 1 yel. brass turnings	4.00c.	4.50c.
No. 1 red brass or compos. turnings	4.25c.	4.75c.
Lead, heavy	2.62½c.	3.00c.
Zinc	2.00c.	2.37½c.
Cast aluminum	10.12½c.	11.25c.
Sheet aluminum	11.50c.	13.00c.

operating under its code on Monday. Practically the only activities of the industry being regulated are working hours and wages. A basic maximum 40-hr. week is specified, at minimum wages varying from 30c. to 47½c. an hr. As has been the custom, the zinc trade will continue to make weekly reports to the American Zinc Institute regarding the quantity of material sold and the prices received for the metal. Also, the members of the industry will continue to report on production, shipments to buyers, and stock position, as well as receipts, consumption and stocks of ores and concentrates.

Chicago Iron and Steel Market

(CONCLUDED FROM PAGE 61)

makers, as well as motor car manufacturers, have been enjoying a sizable export trade.

Wire Products

Demand continues to support mill operations of 50 per cent of capacity. Specifications from the automobile industry are slowly receding, but demand from other sources is well maintained and expanding in some directions. Jobber demand from the agricultural districts is well above what it was a year ago. Utilities, alarmed by proposed legislation at Washington are buying for maintenance purposes only.

Rails and Track Supplies

Rail bookings total 3000 tons, while miscellaneous orders for fastenings aggregate 2000 tons. Both local rail mills are operating, though on much smaller backlogs than a year ago.

Sheets

Mills are booked through this month and beyond on some of the cold-rolled finishes, but are beginning to feel the need for supplementary tonnages in other grades. Business from the automobile industry is tapering and other classes of buyers are cautious in their commitments.

Scrap

Scrap has a weak tone, but consumer purchases are light, and, as a consequence, market quotations are becoming nominal. Railroad lists closing this week include the Chicago & Northwestern, 4000 tons; Missouri-Kansas-Texas, 1000 tons, and the Wabash, 4000 tons.

Warehouse Business

Warehouse bookings in March exceeded those of February by a comfortable margin. April is not



ARE THE WAYS

Plenty of bearing surface, isn't there? Ample distance between them too. What's more they are force feed lubricated with filtered oil and have chilled surfaces.

And for what purpose? Why to give the massive Landis Type 30 Roll Grinder wheel carriage all the support it could possibly require. Vibration is thereby minimized. All overhang is eliminated. The wheel imparts a superior finish to the roll.

You must use a Landis to completely appreciate what this feature means in terms of results. See one of these machines on your own desk—through the medium of catalog H-301.

180

LANDIS TOOL CO.
WAYNESBORO, PA.

starting out as strongly, in terms of demand, as preceding months this year. Separate city and county quotations on bolts and hot-pressed nuts have been put into effect.

Railroad Equipment

RAILS

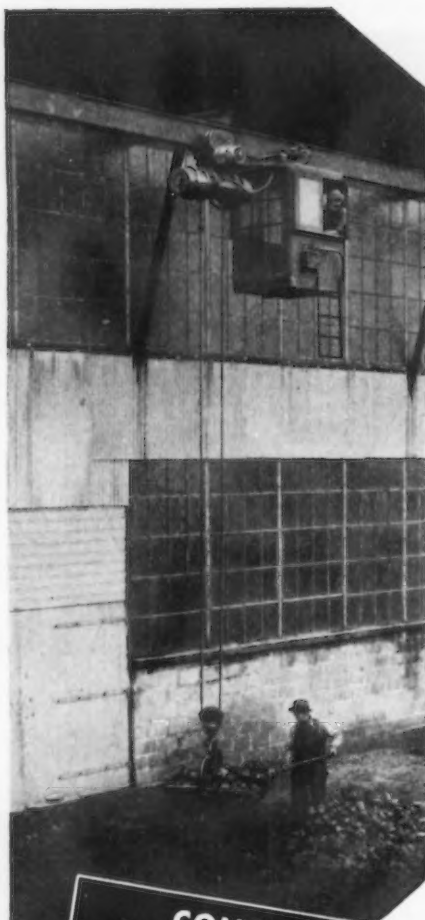
Kansas City Southern has purchased 2000 tons of rails from Illinois Steel Co.

Union Pacific, which recently bought 19,500 tons of rails, divided about 85 per cent of the order about evenly between Illinois Steel Co. and Colorado Fuel & Iron Co., placing remainder with Inland

Steel. This road will shortly allocate orders for 14,000 tons of track accessories.

Western Pacific has ordered 3000 tons of rails from Colorado Fuel & Iron Co.

Automobile registrations in March in Cook County, Ill., of which Chicago is the county seat, were the largest for that month since 1930. The total for last month was 9420, compared with 6833 in February and 4931 in March a year ago. In March, 1930, according to figures released by R. L. Polk & Co., the total was 10,747.



**CONSULT
HARNISCHFEGER
ENGINEERS ON
EVERY HANDLING
PROBLEM**

ADAPTING THE HOIST TO FIT THE NEED—

This cage controlled 3 ton hoist with motor driven trolley makes an ideal cupola charging unit for the Schwab Furnace & Manufacturing Company. Special long drums can be provided to accommodate all long lift applications.

It's the job of P&H Engineers to study your handling problems . . . and to solve them in the most effective, low cost manner. Write for catalog RH-2.

HARNISCHFEGER CORPORATION
4401 W. National Ave., Milwaukee, Wis.

**P&H MILWAUKEE
& ELECTRIC HOISTS**

Boston Scrap Men Waiting for Boats

BOSTON, April 2.—Local scrap exporters are still waiting for boats to load. In the meantime they are buying small tonnages of No. 2 steel and similar material at \$7.25 to \$7.50 a ton, delivered army base here, which is slightly better than heretofore. They admit that they will move the price up to \$8 a ton when vessel space is available.

In contrast, the most brokers will pay for steel turnings for Pennsylvania delivery is \$1.75 a ton f.o.b. While \$5 a ton is the prevailing price on bundled skeleton, \$5.25 was done in the past week. The market for No. 1 steel for domestic consumption is nominal at \$5.75 to \$6.25 a ton f.o.b., and for No. 2 steel, \$5.25 to \$5.75, but owners are reluctant to sell No. 1 and No. 2 steel, turnings or bundled skeleton at these prices.

The status of pig iron remains unchanged. Current sales are scattered and in small lots, with the weekly aggregate only a few hundred tons. Foundries see little indication of a pickup in business this quarter, but furnace representatives profess to foresee some quickening in sales by the end of another month.

Pipe Lines

General Purchasing Officer, Panama Canal, Washington, asks bids until April 12 for 40,000 ft. of galvanized steel pipe (Schedule 3045).

Board of Commissioners of Yachats Water District, Yachats (Lincoln County), Ore., closes bids April 6 for 10,800 ft. of 4-in. steel pipe for trunk line water supply, with alternate bids on 4-in. wood pipe.

Lubbock, Tex., plans steel pipe lines for municipal gas distribution, including main steel pressure pipe line for natural gas. Special election has been called on April 18 to vote bonds for \$1,300,000 for project.

Universal Pipe Line Co., Circleville, Ohio, plans welded steel pipe line for natural gas supply at Circleville and vicinity. Cost close to \$50,000.

Skiatook, Okla., plans about 12 miles of 8-in. steel pipe for gravity flow water line from Mohawk pumping station, Tulsa, Okla., to municipal limits. Fund of \$93,000 is being arranged for this and service facilities for local distribution. Victor H. Cochrane, Wright Building, Tulsa, is consulting engineer.

Virginia Electric & Power Co., Richmond, Va., plans extensions in steel pipe lines for gas distribution in connection with expansion and improvements in gas division, for which fund of \$175,000 is being arranged.

Marcus A. Doty, Munising, Mich., care of D. R. Potter, city clerk, Munising, plans steel pipe lines for gas distribution in connection with local artificial gas plant.

Roseville, Cal., plans 4700 ft. of 16 and 20-in. steel pipe for municipal water supply; also 9775 ft. of 6, 8 and 12-in. cast iron pipe for distribution system. John Shields is city engineer.

San Francisco will take bids April 17 on 330 tons of pipe railing for Trans-Bay bridge distribution structure.



THIS WELDER SHOWED THE WAY

To Lower Costs In Auto Body Building

The whole industry learned something new when a well-known body builder applied P&H-Hansen arc welding to his problem. The result? Faster production, stronger lighter assemblies—lower investment in equipment . . . and a 75% reduction in manufacturing costs!

P&H-HANSEN 50-Amp. Welder

If you find that hard to believe, let us give you the facts. Here's a concrete example of what P&H-Hansens can do to costs with low current welding and a stable arc.

Here's the next big development in welding. If you fabricate with light gauge metals, P&H-Welders can save you money. Investigate now. Write us for complete information, and catalog HW-3.

HARNISCHFEGER CORPORATION
4401 W. National Ave., Milwaukee, Wis.

**P&H HANSEN
& ARC WELDERS**

Buffalo Operations Are Advanced

BUFFALO, April 2.—The Lackawanna plant of the Bethlehem Steel Co. is operating nine open-hearths, having placed an additional furnace in operation late last week. Republic Steel Corp. continues to operate three open-hearths and the Wickwire-Spencer company one. Seneca sheet division of Bethlehem is operating at 75 to 80 per cent.

Placing of fabricated structural and reinforcing bar business is practically at a standstill so far as sizable tonnage goes. No large contract was reported in the last week.

The pig iron business is slow and not up to the level of a month ago. No definite date has yet been set for the blowing in of additional furnaces by the Hanna Furnace Co. and that of the Tonawanda Iron Corp. They are being overhauled at the present time.

With all consuming mills having satisfied their requirements for the time being, scrap transactions are light. The market for cast iron borings and short shoveling steel turnings has strengthened with a dealer who has an order bidding briskly. The opening of navigation is expected to bring an influx of western-purchased scrap into local mills, and apparently they are waiting for this movement to materialize.

Sheet Steel Sales Off At Cincinnati

CINCINNATI, April 2.—Buyer conservatism has retarded sheet steel purchasing in this area to about 75 per cent of capacity output. Users, generally, while still operating at fair rate, indicate a fear of overreaching themselves on material purchases and are curtailing orders to more immediate needs than heretofore. This is especially true of automotive manufacturers, who are holding back purchases while watching carefully the trend of car buying. On the whole, therefore, the reduction in volume purchases is not one of lessened demand, but of management caution. The strike of radio workers in a large Cincinnati plant has not affected the market directly, but some fear of its prolongation tends to unsettle market feeling. Backlogs are almost gone and rolling schedules for this week will be at 70 to 75 per cent of capacity.

Failure of melters to anticipate needs is sustaining weekly pig iron

STEEL FOR INDUSTRY

There is a BISCO Specialty for
Each Tool Steel Application

BISCO

TOOL STEEL TUBING NON-SHRINK OIL HARDENING

Saves Weight and Machining Costs for
RING DIES—SPACERS—BUSHINGS

Shipment From Stock Up to 12" O.D. 2" Wall
Larger Sizes Available

Complete Stocks of BALL BEARING TUBING
In 52100 and 4615 Analyses

Write for Literature

THE BISSETT STEEL COMPANY
CLEVELAND
CHICAGO CINCINNATI

TUNGSTEN CARBIDE

DRAWING DIES FOR WIRE, ROD, TUBING
BOLT EXTRUSION DIES
TIPPED CUTTING TOOLS

TUNGSTEN ELECTRIC CORPORATION

BISSETT STEEL DIVISION

sales at a level of about 800 tons a week. This is largely due to lack of price stimulus, although buyers indicate desire to limit inventories and keep only sufficient material for current use. Shipments on orders are at a steady, high rate, melters ordering out iron almost as fast as they contract. Foundry operations are spotty. Stove and specialty melters are running regular heats at fair level, but automotive foundry operations are declining.

Specifications for foundry coke

grades reflect an active interest in fuel needs, the March index having been higher than February. Prices on by-product foundry will remain at \$9.30, delivered in Cincinnati, during April.

The district old materials market is softer. Dealers bids on all items are down 25c. as mills refuse new purchases. Embargoes against No. 2 steel are prevalent and only contract amounts of other grades are moving. Dealers refuse speculation, contributing a cautiously watchful undertone to the market.

Steel Demand Well Sustained in Valleys Despite Automotive Buying Lull

YOUNGSTOWN, April 2.—Activity in the Valley steel market is fairly well sustained as the second quarter begins. A new fillip to demand is now expected to appear from automotive centers in the shape of substantial steel buying for late April, May and June assemblies. No important covering by the motor car makers has been in evidence for some weeks, and steel producers here are rather sanguine that large-scale replenishments will be made before the middle of April.

Despite the diminishing trend in automotive tonnage in March, aggregate volume of steel orders for the month surpassed that in February. The betterment, though moderate, was encouraging because it was traceable almost entirely to a steady flow of steel orders from miscellaneous sources. The growing demand for consumer goods manufactured of steel is a source of encouragement to Valley steel producers and fabricators and is figuring prominently in the general outlook in this district. From a tonnage standpoint, the farm implement industry is taking the largest share of shipments to the miscellaneous group. Fabricators of shelving, lockers, refrigerators, stoves, drums and barrels and many household utilities are ac-

counting for a goodly share of spot orders for sheets, strip and other grades of steel.

The absence of important buying by the construction industry and the railroads is obscuring hopes for a pronounced revival of steel activity in the second quarter. The pending Federal works relief bill, if enacted this month, is not expected to release funds soon enough to benefit steel mills this quarter. Moreover, it is not yet clear as to the probable allocation of the huge sum involved. If a large share of the principal is marked for the construction industry, and particularly for home building, the usual slow procedure in launching public works projects in the building field is discouraging Valley steel makers to expect much benefit until late this year.

Another unfavorable influence that is rendering inert a large part of the Valleys' pipe producing capacity is the Federal muddle over public utility legislation. Until the utilities are rid of the fear of strangling enactments by the present Government, that important group of steel consumers cannot be expected to place orders. A large potential demand for steel is not being dammed up, but the absence over protracted periods of important line pipe projects, which nor-

mally count heavily in pipe mill schedules, is keeping Valley pipe production at a fairly low rate. Demand for oil country goods has not thus far this year developed the volume expected. The movement of standard pipe and mechanical tubing is not tending upward.

Demand for wire products is showing seasonal improvement, with production here around 50 per cent of capacity. Merchant items, including nails and wire for fencing, are the most active grades moving to farm areas. Nut and bolt makers also are taking a fair quantity of bolt wire.

Although at the outset of second quarter, ingot output here is substantially unchanged, the trend in early prospect is believed to be slightly downward. No material changes are reported in finishing mill schedules, with strip, sheet and tin plate mills extremely busy. Merchant bar mills seem to be faring unusually well. Whatever latent tension attended steel production prior to the threat of a bituminous coal strike has been relaxed, and mill schedules will reflect more clearly the trend in consumer demand for the time being.

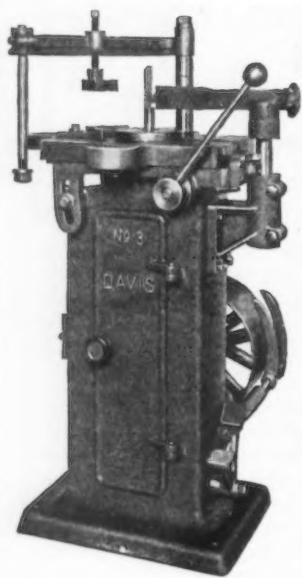
Blast furnace production is substantially the same as a fortnight ago. The heavy increase in demand for steel mill equipment is believed to have accounted for the plans to relight the Struthers Iron & Steel Co. stack at Struthers, Ohio, early this quarter. It is reported that the furnace will be run largely on low phosphorus pig iron, which figures prominently in the manufacture of rolls.

The scrap market seems to have reached a stalemate, so far as important steel mill buying is concerned. No. 1 heavy melting steel is languishing at \$12 a ton.

Scrap Continues to Be Weak at Detroit

DETROIT, April 2.—The Detroit scrap market continues weak with no indication of improvement ahead. A Cleveland mill has begun to take water shipments of scrap from General Motors plants in this district. With this arrangement in effect as well as the plan by which Ford takes scrap from Briggs and Murray, much tonnage of old material is being handled direct from producer to consumer without passing through dealers' hands. Prices are unchanged from those prevailing a week ago.

WHY USE A SHAPER to Cut KEYWAYS?



It's a waste of time and results are likely to be unsatisfactory.

A DAVIS KEYSEATER WILL DO THE WORK QUICKLY AND ACCURATELY.

The capital investment is small.

Write for illustrated circulars today describing the older standard machines, also new style tilting table type.

DAVIS KEYSEATER COMPANY
400 Exchange Street ROCHESTER, NEW YORK

Late Quarter Specifications Help New York Demand



Releases Comparatively Heavy in Last Week With More Quiet Period in Prospect—Pipe Inquiry Fairly Good—Pig Iron Very Dull

NEW YORK, April 2.—With many steel consumers placing last minute specifications against the first quarter contracts, local steel selling offices generally experienced relatively good business in the last week. The two days of the new month, however, have been very quiet, and sellers anticipate little activity during the first part of April. Small orders for immediate delivery are expected to be placed from day to day as in the past, but it is admitted that no marked improvement in buying can be expected unless steel consumption shows a corresponding rise.

Jobbers of reinforcing bars and pipe have recently shown some disposition to build up their stocks which were depleted during the winter. Demand for bars and mesh is improving and a number of road work projects are pending. Grade crossing elimination jobs in Queens and Long Island are outstanding and bids are being taken today on a project of this kind at Laurelton, N. Y., requiring 550 tons of reinforcing bars and 150 tons of sheet steel piling.

The New York Central has placed miscellaneous orders to complete its track buying program for the year, and it is believed that the Pennsylvania and the Baltimore & Ohio will not be in the market for rails during the first half. The only important railroad buying left for the East is that of the Chesapeake & Ohio, the Erie and the Nickel Plate. The New York Board of Transportation may soon ask for bids on 500 subway cars and engineers have begun work on plans for the projected Sixth Avenue subway which may be built with Federal funds.

About 5000 tons of steel is pending for steel pipe projects in the metropolitan district. Most of them call for fabricated plate construction. Otherwise, plates are dull, although eastern ship yards are interested in two tankers for the Gulf Refining Co., Pittsburgh, which call for 8000 tons. Bids on the 1935 Navy construction pro-

gram are expected to be asked in the near future.

Demand for tin plate has eased off somewhat, as large buyers have completed their commitments for the time being. Sheets and strip are less active, but demand for alloy steels, particularly stainless, is well maintained.

Pig Iron

The prospect of higher freight rates in the immediate future has not influenced much spot buying on the part of consumers. Total bookings of district sellers last week amounted to 1900 tons, part of which will be delivered outside of the district. Sales in the previous week totaled 1650 tons and a fortnight ago 1100 tons was booked. However there is a possibility that furnaces will lift third quarter base prices, for freight rates on coke and iron ore will be

3c. to 15c. higher during the second quarter. Such a situation has possibilities of influencing heavy third quarter pig iron coverage during the second quarter.

Reinforcing Steel

Miscellaneous demand is holding up but there is almost a total lack of tonnage projects. State highway departments have not issued any new specifications and there are no new private building projects in this immediate territory. The one award of the week called for 150 tons for a Westchester County bridge, N. Y., which was placed with Concrete Steel Co.

Scrap

Despite the steadier appearance in Philadelphia, the market in this area continues to have a weak undertone. This probably arises from the efforts of foreign buyers to drive prices down on new business. However brokers are meeting these lower offers only in exceptional cases, for they all have old contracts which they are attempting to cover. Brokers are offering \$9 and \$7.50 in most cases for No. 1 and No. 2 steels delivered alongside barge, but the flow from dealers at these price levels is still not as large as is desired. Several lots of steel have been shipped to the Pittsburgh district, but otherwise domestic market activity is confined to occasional deliveries of stove plate, cast grades and specialties into eastern Pennsylvania.

best for Power or Hand Sawing

Unbreakable --High Speed Steel Edge

Exclusive MARVEL High-Speed-Edge BLADES

- 1 Tough Alloy Steel Body.
- 2 Patented Electric Weld.
- 3 18% Tungsten High Speed Steel Edge.

High Speed Steel for cutting; tough Alloy Steel to take the strain and shock. Only MARVEL High-Speed-Edge Blades combine these features . . . can give the fast-cutting, long-lasting qualities of genuine 18% Tungsten High Speed Steel and at the same time be **POSITIVELY UNBREAKABLE**, shatter-proof, safe. For uninterrupted, scheduled production; for a full profit on each job . . . for absolute dependability and low blade cost, use MARVEL High-Speed-Edge BLADES for all metal sawing.

Write for Bulletins

Armstrong-Blum Mfg. Co. "The Hack Saw People" 349 N. Francisco Ave., CHICAGO, U. S. A.

New MARVEL Heavy-Duty Hand Frame

Holds blade under tension. Low 2-hand grip gives power, accuracy and prevents wedging or rocking in cut.

Eastern Pennsylvania Steel Rate Holds at 33 Per Cent



Awards of Shapes Slightly Heavier—
Alan Wood Lights Swedeland Furnace
—Scrap Steadier at Unchanged Levels

PHILADELPHIA, April 2.—Mill activity in the Philadelphia district has apparently reached a minimum level, and further recession in the operating rate should come about only through lessened activity in light flat-rolled products at Bethlehem's Sparrows Point plant. Worth Steel Co. has added a second open-hearth, but another furnace will be shut down for repairs within the next fortnight. The Pencoyd melter continues to operate four furnaces each week, and operations at all other district mills are practically unchanged from the previous week. Aggregate district operations remain at approximately 33 per cent of capacity.

All steel sellers report a slight slackening of general miscellaneous demand, attributable to the uncertainty as to the fate of the steel code and basing point set-up. The subject of lower prices admittedly was gaining momentum a week ago, but the ICC ruling permit-

ting the raising of freight rates on coke, iron ore, scrap, and certain finished steel products has definitely altered the situation. Mills are now talking slight advances on certain commodities, and this attitude may be the stimulus needed to influence heavier forward purchases on the part of steel users.

Both of the principal railroads buying in this district have recently entered commitments for repair materials in addition to routine quarterly purchases. Perhaps the prospect of higher freight revenues will influence more liberal releases on the part of railroads. However most steel sellers here remain somewhat skeptical.

Pig Iron

Alan Wood's Swedeland furnace was lighted today and will probably run through the summer. Iron sales have eased off slightly, and forward bookings made in March are judged to be considerably under the February total. Railroad tariffs

on iron and coke are due for a rise, and, as a result, some pig iron consumers are fearful of advances in prices. This attitude may serve to overcome the protracted hesitancy of buyers and force in a heavier volume of forward business.

Sheets and Strip

A local manufacturer of oil tanks has added 50 men and several other tank makers report better business. As a result there is a slight improvement in demand for heavy sheets and light plates. Local auto body stamping plants are drawing on old contracts for much of their full-finished sheet requirements, consequently fresh sales of this grade are currently far lighter than a month ago. Strip continues to move only in small lots, and tin plate sales in this area are very light despite the exceptional demand for this grade of material in other districts.

Bars, Plates and Shapes

Cold-drawn bars are very quiet. Likewise reinforcing bars are temporarily inactive. Miscellaneous plate demand continues in fair volume with several new projects in prospect. Bids go in this week on two tankers which will require about 8000 tons of plates and shapes, and sellers are still hoping for an early award on the 600 tons required for the Erie ferryboat. Awards of shapes rose slightly during the week. Belmont Iron Works will supply 380 tons for du Pont buildings at Carneys Point, N. J., Anthracite Bridge Co. was awarded 140 tons for a hospital addition at Scranton, Pa., and Reading Metalcraft Co. has taken 120 tons for a grocery warehouse at Reading, Pa. Active tonnages include 425 tons for a bridge at Paulsboro, N. J., and 600 tons for a high school at Cumberland, Md.

Imports

The following iron and steel imports were received here last week: 7520 tons of manganese ore from the Gold Coast; 540 tons of pig iron from British India and 412 tons of the same product from Spain; 200 tons of ferromanganese from Norway, and 32 tons of steel wire, 12 tons of steel bars, 10 tons of steel tubes, 3 tons of steel rods and 1 ton of steel forgings from Sweden.

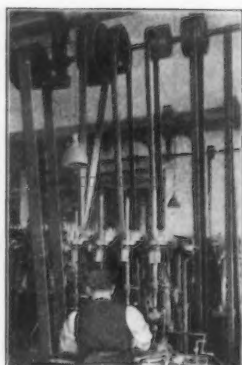
Scrap

For the tenth consecutive week Lukens Steel Co. is restricting shipments, and practically all other

Schieren

Belting GIVES YOU AN EXCELLENCE
OF PERFORMANCE THAT IS POSSIBLE ONLY
THROUGH—

SCHIERENIZING



Always Dependable

One of the important results of Schieren-izing is the exceptional pliability of Schieren Belts. Even though the belts run loose on the pulleys, the slippage will be much less than that of ordinary belting; furthermore, frequent shortening of the belts is eliminated. ● The extra pliability of Schieren Belts and their freedom from internal friction permit their use on very small pulleys. ● The advantages of Schieren Belting are many. You can have them at no increase over the price you now pay for ordinary belting. Write for prices on the thickness of belts you commonly use.



district melters are drawing from reserves rather than maintaining stocks at usual levels. No important domestic sales have been made and prices on heavy steels are quotably unchanged. Even though domestic disinterest continues, withdrawals for export and the low stock piles in dealers' yards are two definite factors opposing further recessions. Currently, no boat is loading at Port Richmond. Scrap accumulations on cars at that point are again quite large and dealer purchases have consequently eased off somewhat. Philadelphia dealers continue to receive unprepared scrap by truck from Virginia and Maryland. This trucking activity has grown to quite large proportions in the last few months, and has been a large factor working for the steady supply of scrap in this immediate area. The *Morro Castle* will be cut up at Baltimore by Union Shipbuilding Co. The boat will supply about 10,000 tons of mixed scrap, and much of this material will probably be added to the 200,000-ton accumulation of Union Shipbuilding Co.

Cast Iron Pipe

Madison, Wis., will take bids April 3 on 2000 ft. of class A 8 to 20 in.

Bland, Mo., will take bids April 12 on 15,500 ft. of 2 to 8-in. for waterworks and sewer system, a PWA project. George E. Wells, St. Louis, is engineer.

Keytesville, Mo., plans pipe lines for water system; also other waterworks equipment. Russell & Axon, 4903 Delmar Boulevard, St. Louis, are consulting engineers.

Loganport, La., will soon take bids for 23,030 ft. of 2, 6 and 8-in. for water system; also for about 3000 ft. of galvanized wrought iron pipe, 50,000-gal. steel tank on 100-ft. steel tower, pumping machinery and other waterworks equipment. Fund of \$43,000 has been arranged.

Binghamton, N. Y., plans extensions in water pipe lines. Fund of about \$850,000 will be arranged for this and other waterworks expansion and improvements. Hoadley & Prentiss, Binghamton, are consulting engineers.

Hempstead, Md., plans pipe lines for water supply. Bond issue of \$33,000 for this and other waterworks installation is being arranged.

Watford City, N. D., plans pipe lines for water system; also 75,000-gal. elevated steel tank and tower, pumping machinery and other waterworks equipment. Fund of \$40,000 is being arranged. G. H. Bugenhagen, 206 First Avenue, Minot, N. D., is consulting engineer.

Sabetha, Kan., will take bids at once for six miles of 8-in. for new water line; also for water purification plant and other waterworks equipment. Cost about \$140,000. Paulette & Wilson, Farmers' Union Building, Salina, Kan., are consulting engineers.

Princeton, Wis., closes bids April 18 for water pipe; also for elevated steel tank and tower, pumping machinery and accessories, fittings, etc. A. E. McMahon Engineering Co., Menasha, Wis., is consulting engineer.

Greenwood Lake Village, N. Y., asks bids until April 8 for about 38,000 ft. of 6, 8 and 10-in. for water system; also for

INDUSTRY ACCEPTS

The CONE WORM GEAR



Production steadily increases on "Cone" Worm Gears,—
There's only one answer!

The Government—machinetool builders—road machinery manufacturers—makers of speed reducers—automobile plants are typical of scores of customers that use "Cone" Worm Gears as Standard Equipment.

"Cone" design is different. Ask about it.

MICHIGAN TOOL CO. 7171 E. 6 MILE RD. DETROIT, MICH.

200,000-gal. steel standpipe, pumping machinery and auxiliary equipment. Solomon & Keis, 257 Broadway, Troy, N. Y., are consulting engineers.

Methuen, Mass., plans about 10,000 ft. of 6-in. for new water lines in several city streets.

Kansas City, Mo., let contract to National Cast Iron Pipe Co. for about 400 tons of 16-in. for main water line.

Port Allen, La., closes bids April 16 for pipe for water lines; also for other waterworks construction. Cost about \$21,000. L. J. Voorhies, Baton Rouge, La., is consulting engineer.

Menomonie, Wis., plans 6-in. for water lines in number of city blocks.

Apache, Okla., plans pipe lines for water system. Bond issue has been authorized. W. C. Howard, Waurika, Okla., is consulting engineer.

Burlingame, Cal., has awarded 100 tons to United States Pipe & Foundry Co.

Beverly Hills, Cal., has let general contract for water system improvements which include 162 tons to be purchased by contractor.

Tremonton, Utah, has opened bids on 118 tons.

Orem, Utah, will take bids April 9 on 634 tons of 8 and 12-in.

Large Construction Jobs on West Coast

SAN FRANCISCO, April 1.—The contract for the construction of the Fort Peck spillway gate and cut-off structures is outstanding among pending projects on which bids are to be taken soon. Approximately 11,168 tons of reinforcing bars, 4317 tons of structural steel, 115 tons of steel sealing strips and 510 tons of miscellaneous steel will be included in the Fort Peck bids

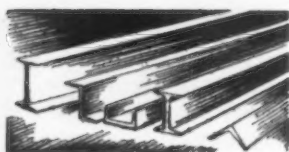
which will be opened during the coming week.

April 17 has been set as the date for bids on the San Francisco-Oakland bridge distribution structure. Specifications call for 2250 tons of structural steel, 1750 tons of reinforcing bars and 330 tons of pipe railing. On April 20, bids will be taken on the Mad River dam and pipe line to be constructed near Eureka, Cal. Involved in the project are 1300 to 1600 tons of plates, 300 tons of bars and 100 tons of shapes.

Lettings during the week have been limited and mostly for minor tonnages. Pacific Coast Steel Corp. will furnish 383 tons of structural steel for Marina Junior High School at San Francisco and approximately 800 tons of shapes for the Mare Island Navy Yard crane which was let to Star Iron & Steel Co. In Los Angeles the Department of Water & Power reports Western Pipe & Steel Co. as low bidder on 3000 tons of plates.

An increase in activity is reported in the Northwest where a number of State and municipal projects are rapidly nearing the bid-taking stage. Construction in Southern California continues to lead the Coast although few of the projects involve major tonnages. With several contracts including sizable steel tonnages in the offing, business in the San Francisco area is looking up. Warehouse sales continue to show slight but favorable gains.

Steel Output Rises in Cleveland-Lorain District



Specifications Somewhat Lighter
Although Automotive Demand Is
Expected to Be Maintained at High
Level Through May

CLEVELAND, April 2.—The decline in ingot output in the Cleveland-Lorain territory has been checked, and a two-point advance to 56 per cent capacity has occurred this week, due to the starting up of two additional open-hearth furnaces by a local plant which entered some new semi-finished steel tonnage, enabling it to increase operations. Another Cleveland plant which has been operating at capacity for several weeks took off an open-hearth furnace.

The second quarter has started with a declining demand for finished steel and much uncertainty over the volume of business in the next few months. However, with considerable tonnage on their books for delivery extending into May, and with the belief that the automotive industry will keep

going at a fairly good pace for some time, sheet mills look for a good volume of business through the second quarter. There has been no falling off in the good demand for sheets from makers of household equipment.

Conditions are somewhat mixed in the automotive field. While some business is coming from that source for extended shipment deliveries of finished parts by suppliers are being held up and this is resulting in the suspension of shipments by mills. The placing of some automotive orders for sheets, strip and rim stock which were expected this week has been deferred until the end of the month. These developments indicate that some of the automobile companies have been taking in material faster than needed. A few of the sheet mills supplying the automotive trade

have curtailed operations but others will be able to continue recent schedules well through the month.

The tendency of miscellaneous consumers is to keep their steel inventories very low and they are ordering only in small lots. There is very little new construction work. State bridge work is being held up, evidently to wait for Federal funds to be made available by the work relief bill, and some railroad bridge work for which plans have been prepared is not coming out. It is believed that the railroads are waiting to see what assistance the Government will give them in carrying out their bridge building program.

Pig Iron

The cost of making pig iron will be increased 40c. or more a gross ton by the freight rate increase granted by the Interstate Commerce Commission. Producers will be unable to pass along the increased cost to their consumers before the third quarter. Sales have continued to taper. One lake furnace interest sold 3000 tons during the week or only about one-half of its recent average weekly volume. Practically all the iron covered by first quarter contracts was shipped. Shipments in March were 20 per cent larger than in February. Automobile foundries still are taking a fair tonnage of iron. Castings for motors and other parts for electric refrigerators are crowding foundries specializing in that work. A refrigerator takes about 50 lb. of castings.

Iron Ore

The 10c. a ton advance in the freight rate on ore granted by the Interstate Commerce Commission is expected to be divided equally between the northern railroads that carry ore to the shipping ports and the roads that deliver it from the lower lake ports to consuming points, as this method of revising rates was followed previously when a rate advance was allowed. No inquiries for ore for this season have as yet come out. In making predictions of shipments of Lake Superior ore this year producers are giving consideration to a tendency among consumers to reduce their ore reserves. From 1912 to 1930 inclusive, annual shipments exceeded 40,000,000 tons with the exception of two years and during 11 years were in excess of 50,000,000 tons. The largest amount shipped in the last four years was 23,496,228 tons in 1931. Ore reserves in furnace yards and

Wire Forms That Fit!

E.H. TITCHENER & CO.
200-206 WALNUT ST. BINGHAMTON, N.Y.

WIRE STAPLES **ALL SIZES**

on docks on May 1 have been gradually declining from a peak of over 32,000,000 tons in 1932 to 26,500,000 in 1934, and they will be at least 24,500,000 on May 1 this year. This decrease might have been more rapid had not the mining companies during one or two years operated their mines in excess of requirements in order to furnish employment for their miners. The normal amount of ore in reserve on May 1 was placed at 20,000,000 tons during the years of heavy shipments but some express the opinion that this amount should be revised downward. The above figures show that consumers have gone a long way in reducing their ore inventories in the past four years, but they still have stocks considerably in excess of what has been regarded as the normal supply.

Sheets

While demand has tapered off, automobile manufacturers are still buying sheets both for April and May production, although their orders are not as large as recently. Some automotive tonnage has been held up by Cleveland stamping plants which have had their shipments of parts suspended by one or two automobile companies. Demand for enameling sheets from refrigerator and stove manufacturers continues heavy. Although backlogs are being reduced there has not been much curtailment of sheet mill operations. One producer will be able to operate at full capacity until April 15 and others have their order books well filled for nearly the entire month. With orders already on hand and additional business that will be placed, producers look for good operations through the present quarter.

Strip Steel

There has been some decline in production due to the recent falling off in new business and further curtailment is expected during the coming week. There is a scarcity of new orders from leading makers of automobile parts and very little business from consumers outside of the automotive field.

Bolts and Nuts

The 5 per cent advance in prices became effective on contracts April 2 and this brought out considerable business from customers having first quarter contracts and from jobbers during the past week. Manufacturers will make shipments against these orders until April 15. Specifications continue heavy from the automotive indus-

PERFORATED METALS..
FOR EVERY PURPOSE

Plain and Ornamental Perforations in a great variety of sizes and styles, made in any metal.
Excellence of product and low prices.

The Harrington & King
PERFORATING CO.
5657 FILLMORE ST. CHICAGO, ILL.

try which buys special bolts that do not come under the regular price schedule.

Bars, Plates, and Shapes

Demand for bars has declined. Consumers are ordering only in small lots for early needs and some mills are losing business because others can make prompt deliveries. Miscellaneous demand for car lots of plates is fair. Activity in the construction field is light. The Ohio State Highway Department has advised fabricators that it will issue no new inquiries for bridge work before June. An inquiry is out for a factory building in Elyria requiring 300 tons. Demand for reinforcing bars in small lots shows a seasonal improvement.

Scrap

In the absence of any new demand to support the market, prices on heavy melting steel have again declined 50c. a ton. Outstanding orders are about all filled and as mills still have fair stocks there is no expectation of new buying in the next two or three weeks. Two small cargos, the first water shipments of the season, reached Cleveland plants from Detroit at the end of the week. The Nickel Plate Railroad has issued a list of 800 tons and the New York Central and Erie roads have sent out blanket lists.

Reinforcing Steel

Awards 1735 Tons—New Projects
2200 Tons

AWARDS

Hammond, Ind., 900 tons, filter plant, to W. J. Holliday & Co., Chicago.

State of Illinois, 200 tons, State road work, to Calumet Steel Co.

Port Angeles, Wash., 128 tons, city bridges, to Pacific Coast Steel Corp.

Yuba County, Cal., 119 tons, widening seven State bridges, to Palm Iron Works.

San Francisco, 117 tons, Patrick Henry school, to Concrete Engineering Co.

Huntington Park, Cal., 125 tons, school reconstruction, to an unnamed bidder.

State of California, 140 tons, highway work in eight counties, to an unnamed bidder.

NEW REINFORCING BAR PROJECTS

Chicago, 5500 tons, Stickney project for Sanitary District of Chicago; Herlihy Mid-Continent Co., Chicago, low bidder on general contract.

Detroit, 900 tons, parcel post building; general contract awarded to Joseph A. Holpuch Co., Chicago.

Springfield, Ill., 100 tons, road work; bids to be taken April 7.

Oakland, Cal., 1750 tons, Trans-Bay bridge distribution structure; bids April 17.

Los Angeles, 100 tons, electric distribution station on Whittall Boulevard; construction to start during summer.

Los Angeles, 125 tons, factory and office building for Max Factor; bids opened.

Thurston County, Wash., 118 tons, State crossing; bids April 9.

ARMSTRONG

TRADE MARK REG. IN U.S. PAT. OFFICE

Drop Forged WRENCHES

Designs and proportions are based upon practical knowledge of wrench requirements, while modern manufacturing methods and equipment assure accuracy and uniformity in both machining and finish.

**Special
CHROME-VANADIUM
STEEL**

**Special
CARBON
STEEL**

50 Types, All Sizes, 1 Quality

Standardize on ARMSTRONG WRENCHES for uniform quality. There are no ARMSTRONG "seconds" or "imperfects," for each ARMSTRONG Wrench that does not pass the most rigid inspection and test is destroyed.



**WRITE
FOR
CATALOG**

ARMSTRONG BROS. TOOL CO.

"The Tool Holder People"

309 N. Francisco Ave., CHICAGO, U. S. A.
New York Sales Office: 109 Lafayette Street
London Branch: ARMSTRONG BROS. TOOL CO., LTD.

Fabricated Structural Steel

Lettings Decline—New Projects in Better Volume

STRUCTURAL SHAPE AWARDS

NORTH ATLANTIC STATES

Andover, Mass., 255 tons, junior high school, to New England Structural Co.

Kingston, R. I., 185 tons, home economics building, to James H. Tower Iron Works.

Monticello, N. Y., 185 tons, high school, to McClintic-Marshall Corp.

Niagara County, N. Y., 215 tons, State highway bridge, to R. S. McManus Steel Construction Co.

Elizabeth, N. J., 150 tons, Wilson-Jones building, to Lafayette Iron Works.

Carneys Point, N. J., 400 tons, E. I. duPont de Nemours & Co., buildings, to Belmont Iron Works.

Scranton, Pa., 150 tons, hospital addition, to Anthracite Bridge Co.

Reading, Pa., 130 tons, warehouse for Keystone Grocery Co., to Reading Metalcraft Co.

SOUTH AND SOUTHWEST

New Tazewell, Tenn., 1660 tons, Clinch River bridge, to Nashville Bridge Co.

Lexington, Va., 445 tons, State highway bridge, to Virginia Bridge & Iron Co.

State of Arkansas, 325 tons, four State highway bridges, divided among Virginia Bridge & Iron Co., Arkansas Foundry Co., Fort Smith Structural Steel Co. and Vincennes Bridge Co.

Crowell, Tex., 250 tons, bridge, to North Texas Iron & Steel Co.

Phoenix, Ariz., 820 tons, post office, to Ingalls Iron Works Co., previously reported to McClintic-Marshall Corp.

CENTRAL STATES

Osborn, Ohio, 110 tons, cement plant, to Oregonia Bridge Co.

Birds, Ill., 150 tons, State highway bridge, to R. C. Mahon Co.

Rock Valley, Iowa, 225 tons, bridge, to Pittsburgh-Des Moines Steel Co.

State of Iowa, 500 tons, four State highway bridges, divided among Pittsburgh-Des Moines Steel Co., Des Moines Steel Co. and Vierling Steel Works.

Cedarburg, Wis., 250 tons, canning factory, to Worden-Allen Co.

St. Louis, 100 tons, warehouse for Jefferson Barracks, to Mississippi Valley Structural Steel Co.

Pike County, Mo., 110 tons, highway bridge, to Pittsburgh-Des Moines Steel Co.

State of Missouri, 175 tons, State highway bridges, to St. Louis Structural Steel Co.

WESTERN STATES

Warm Springs, Mont., 160 tons, hospital, to Kalman Steel Corp.

Grand County, Colo., 143 tons, State bridge west of Granby, to an unnamed bidder.

San Francisco, 383 tons, Marina Junior High School, to Pacific Coast Steel Corp.

Mare Island, Cal., 800 tons, crane for Navy Yard, steel purchased by Star Iron & Steel Co. from Pacific Coast Steel Corp.

Orkensburg, Cal., 125 tons, Amalgamated Star Co. plant, to Ogden Iron Works.

Glendale, Cal., 100 tons, city garage, to Consolidated Steel Corp.

Long Beach, Cal., 200 tons, Lowell high school, to Pacific Iron & Steel Co.

Placentia, Cal., 160 tons, Placentia Orange Growers Association, packing plant alterations, to Pacific Iron & Steel Co.

Everett, Wash., 225 tons, bridge, to Pacific Car & Foundry Co.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Hartford, Conn., 750 tons, grade crossing eliminations at Windsor and Avon Streets.

Baltimore & Ohio Railroad, 215 tons, grade crossing eliminations on Staten Island, N. Y.; bids due April 8 to Staten Island Rapid Transit Commission.

New York, 200 tons, market building at Bronx Terminal.

District of Columbia, 130 tons, pumping station.

SOUTH AND SOUTHWEST

State of Texas, 1325 tons, State highway bridges.

Trinity County, Tex., 270 tons, highway bridge.

Texas County, Okla., 400 tons, State highway bridge.

CENTRAL STATES

Elyria, Ohio, 300 tons, building for Western Automatic Machine Co.

Cleveland, 200 tons, building for Easterly Sewage Disposal plant.

Kalamazoo, Mich., 200 tons, factory building for Upjohn Co.

Glenn Carbon, Ill., 310 tons, State highway viaduct over railroad; bids April 9 at State Capitol, Springfield.

Marysville, Ill., 100 tons, viaduct over railroad; bids April 9 at State Capitol, Springfield.

Mendota, Ill., 130 tons, railroad underpass; bids April 9 at State Capitol, Springfield.

Blodgett, Will County, Ill., 600 tons, highway bridge over Chicago & Alton and Santa Fe tracks; bids April 9 at State Capitol, Springfield.

Chicago, 450 tons, structural and miscellaneous steel for Stickney project, Sanitary District of Chicago; Herlihy Mid-Continent Co., Chicago, low bidder on general contract.

St. Paul, Minn., 500 tons, street underpass in city; general contract bids to be taken by State, April 16.

St. Paul, 150 tons, State bridge; bids to be taken April 16.

WESTERN STATES

Wiota, Mont., 550 tons, cableway towers for Fort Peck Dam.

Oakland, Cal., 2250 tons, Trans-Bay bridge distribution structure; bids April 17.

Berkeley, Cal., 170 tons, building for American Forge Co.; plans completed.

Delano, Cal., 132 tons, Southern Pacific Co. underpass; bids soon.

San Jose, Cal., 120 tons, Southern Pacific Co. overpass over Bird Avenue; bids opened.

San Francisco, 140 tons, car apron at pier 43; bids under advisement.

Los Angeles, 125 tons, electrical distributing station on Whittall Boulevard; construction to start during summer.

FABRICATED PLATE

AWARDS

Pittsburgh, 606 tons, six coal barges for J. F. Klein Co., to Ingalls Iron Works Co.

Baltimore, 290 tons, tunnel liners for Pennsylvania Railroad, to Truscon Steel Co.

La Crosse, Wis., 425 tons, gas holder, to Stacey Brothers Gas Construction Co.

Galveston, Tex., 200 tons, Government project, to King Boiler Works, Galveston.

NEW PROJECTS

New York, 8000 tons, two tankers for Gulf Refining Co.; bids in this week.

Torrance, Cal., 150 tons, tank, bids April 23.

San Jose, Cal., 200 tons Coyote dam and spillway; bids April 5.

Camarillo, Cal., 200 tons, two boilers at State hospital; bids under advisement.

Los Angeles 3000 tons, material for Department of Water and Power; Specification 1641, Western Pipe & Steel Co. low bidder.

SHEET PILING

AWARDS

Huron, Ohio, 350 tons, Wheeling & Lake Erie Railroad dock, to Carnegie Steel Co.

Canadian Building Industry Reviving

TORONTO, April 2. — While business is holding at a steady level in the Canadian iron and steel markets, orders are largely for small tonnages. The building trades recently have shown a minor revival in activity, principally because of the building program announced by the Federal Government, and structural steel sales are showing indications of improvement. The Hamilton Bridge Co., has received a contract for 500 tons of steel for the new \$1,600,000 Hamilton, Ont., post office. It is understood that a few other projects are pending which will require about 3000 tons of steel. The automotive industry continues to furnish a steady demand for materials. The mining industry has been making some good purchases, and a number of companies are rushing in equipment and supplies before the spring thaw. Mills are maintaining production at about 50 per cent of capacity while foundries are running at around 40 per cent.

Pig iron production for February, with three stacks blowing, totalled 37,259 tons against 44,416 tons in January, the decline being largely due to the shorter month.

Demand for merchant pig iron is holding at a level slightly in excess of 600 tons per week. Melters are confining purchases to small tonnage lots for spot delivery, and no forward delivery contracts have been placed. Individual orders range from 50 to 200 tons. Local blast furnace representatives anticipate further improvement in demand for iron later in the year. Prices are firm and unchanged.

Trading in iron and steel scrap is showing minor improvement and it is stated that Montreal dealers have received a few inquiries from Britain for steel scrap for shipment with the opening of St. Lawrence navigation.

Lighter-than-air craft will be discussed by Lieut. Commander C. E. Rosendahl, United States Navy, at a meeting of the metropolitan section, Society of Automotive Engineers, to be held on the evening of April 8, at the Roger Smith, New York. Prof. Alexander Klemin, Daniel Guggenheim School of Aeronautics, New York University, will lead the discussion.



Speedy Delivery!

You get it when you purchase

BOLTS

NUTS

SCREWS

from

CLARK BROS BOLT CO.

Clark Street
MILDALE, CONN.



Will Changes in Motive Power Revolutionize the Railroads?

(Concluded from page 19)

fact that over 37 per cent of the locomotives in the present inventory are over 25 years old indicates that much could be done to advantage in a greater utilization of power, scrapping units at the end of their economic life, and this would decidedly reduce the advantage shown in favor of the Diesel locomotive from the standpoint of stand-by loss.

Comparison of Initial Costs

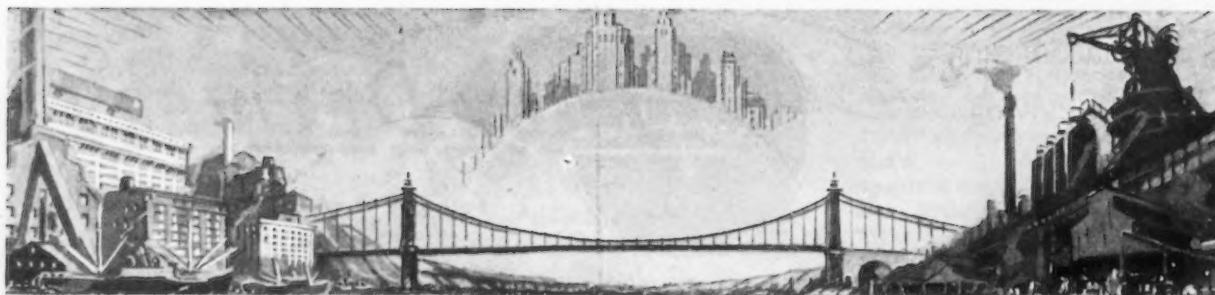
To any saving in fuel cost must be added the much greater first cost and interest on the investment. A steam locomotive of 6000 drawbar horsepower can be built for not to exceed \$150,000. The same drawbar horsepower in a Diesel unit would cost upward of \$600,000, based on any figures at which Diesel equipment has been sold. Furthermore it would probably consist of two articulated or four single units with its multiplicity of power plants, electrical equipments, running gear, etc., on which the maintenance expense must undeniably be greater than for the

single steam unit. The steam unit could be built within the clearance and wheel load limitations of any of the Class I railroads, whereas no single Diesel unit of 6000 hp. could be built within these limitations.

The steam switcher for which the curve is shown on Fig. 1 could be built for less than one-half the cost of the oil engine for which the curve is shown. Drawbar horsepower, from the standpoint of first cost, can be produced cheaper in steam than in any other type of locomotive.

(To be continued)

A chain of all metal gas service stations will be designed and constructed by Austin Co., Cleveland, for the Ohio Oil Co., Findlay, Ohio. These will be built of prefabricated sections doubly insulated and having porcelain enamel exterior panels. Each station will take approximately 15 tons of steel. The roof will require 2½ tons of formed sheet steel.



Plant Expansion and Equipment Buying

Equipment Market Still Marking Time

WHILE prospects for machine tool business still continue to be good, current demand continues this week, as last, to mark time. Sales are limited mostly to scattered groups of single tool orders. Jobbing work, in many plants, is showing increased activity and there is a good flow of repair part orders.

These indications confirm the belief that many expectant purchasers of new equipment, in doubt about the immediate Washington outlook, are also marking time until the economic and legislative "visibility" is somewhat improved.

◀ NORTH ATLANTIC ▶

Socony-Vacuum Oil Co., Inc., 26 Broadway, New York, has filed plans for three additions to bulk storage and distributing plant at Tottenville, S. I. One of units will be used for motor truck service, repair and garage building. Several new steel tanks and accessory equipment will be installed. Cost about \$75,000 with equipment.

Atlas Metal Products Corp., 150 Varick Street, New York, has leased about 10,000 sq. ft. in building at 47-40 Metropolitan Avenue, Long Island City, for new plant.

Board of Education, Park Avenue and Fifty-ninth Street, New York, plans manual training equipment in new multi-story Manhattanville junior high school at Amsterdam Avenue and 129th Street, for which bids have been asked on general contract. Appropriation of \$1,100,000 has been arranged for building and equipment. W. C. Martin, Flatbush Avenue Extension and Concord Street, Brooklyn, is architect and superintendent for board.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until April 12 for 160,000 lb. steel rivets and 2500 lb. steel tap rivets for Brooklyn Navy Yard (Schedule 4691); until April 9, 16 fuel oil burners and spare parts (Schedule 4591) for Brooklyn and Charleston, S. C., yards; until April 12, incandescent searchlights and spare parts (Schedule 4641), steel tubing (Schedule 4666), and governors for reciprocating pumps and repair parts (Schedule 4605) for Brooklyn, Philadelphia and Charleston yards.

American Can Co., 230 Park Avenue, New York, plans new one-story plant at Geneva, N. Y. Cost over \$60,000 with equipment. Company is also considering branch plant at Tampa, Fla., or vicinity, to cost in excess of \$100,000 with machinery.

Aerial Machine & Tool Co., 591 Hudson Street, New York, manufacturer of light tools and machinery, has leased space in

building at 260-62 West Street, for new works.

Signal Supply Officer, Army Base, Brooklyn, asks bids until April 15 for 72,000 ft. cable and 42 reels (Circular 105), two power control boards (Circular 106).

Pan-American Airways, Inc., 122 East Forty-second Street, New York, has let general contract to Blythe & Staats Co., Brownsville, Tex., for new units at airport at Brownsville, including radio transmitter house with steel towers, antenna and other equipment. Bids have also been asked for addition to hangar, for repairs, reconditioning of motors, etc. Cost close to \$45,000 with equipment. W. F. Godwin is company architect.

Articulating Valve Corp., New York, has been organized by Herman C. Kupper, 410 East Fifty-seventh Street, New York, and John J. Dewey, Greenwich, Conn., to manufacture valves and kindred engineering specialties, and operate a general machine works.

Penn-Maryland Corp., 120 Broadway, New York, a subsidiary of National Distillers Products Co., same address, plans addition to distillery at Carthage, Ohio, including general distilling units and mechanical bottling works. Cost about \$150,000 with equipment.

Bureau of Yards and Docks, Navy Department, Washington, asks bids until April 10 for two steel radio towers and steel mast for Brooklyn Navy Yard (Specification 7893).

New York Shipbuilding Corp., Camden, N. J., will make improvements in branch shipbuilding and repair plant at Gloucester City, including equipment installation. Shipyard has been idle for about 15 years and will be used for manufacture of turrets for decks of naval vessels built at Camden yard, and other ship equipment.

Standard Optical Mfg. Co., 823 Hunterdon Street, Newark, N. J., has purchased two-story building at Irvington, near New-

ark, and will improve for new plant, including precision machine department for metal specialties. John M. Okner is head.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until April 9 for three boring bars and one worm gear-drive (Schedule 4626), three magnetic controllers, three motors, etc. (Schedule 4627); until April 12, one motor-driven sensitive drilling machine (Schedule 4655), one motor-driven drilling machine (Schedule 4653), 378 bomb release handles (Schedule 4603); until April 16, 1000 check valves for hydrostatic type aircraft fuel quantity gages (Schedule 4660) for Philadelphia yard.

Pure Springs Brewing Co., Fountain Springs, Pa., plans early rebuilding of part of plant recently damaged by fire. Loss over \$50,000 with equipment.

Supply Officer, Naval Aircraft Factory, Navy Yard, Philadelphia, asks bids until April 9 for brass plate washers, spring steel lock washers, steel plate washers, aluminum plate washers, aluminum alloy washers, etc. (Aero Req. 878).

◀ BUFFALO DISTRICT ▶

Consolidated Aircraft Corp., 2050 Elmwood Avenue, Buffalo, manufacturer of Government and commercial airplanes and parts, is considering new plant on waterfront property at San Diego, Cal., for production of flying boats, including parts manufacture and assembling. Cost close to \$100,000 with equipment. Major Reuben H. Fleet is president.

Jamestown Macadam Co., Jamestown, N. Y., has leased two-acre tract at Dunkirk, N. Y., for manufacture of asphalt and allied products. Crushing, mixing, conveying, loading and other equipment will be installed. Company has also leased dock property near site for storage, distribution and shipping service. Cost over \$50,000 with equipment.

Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ont., affiliated with Firestone Tire & Rubber Co., Akron, Ohio, has plans for one-story addition. Cost over \$45,000 with equipment. Hutton & Souter, Piggott Building, Hamilton, are architects.

◀ NEW ENGLAND ▶

Robert Gair Co., 155 East Forty-fourth Street, New York, manufacturer of corrugated and other containers, has acquired Androscoggin Pulp Co., South Windham, Me., manufacturer of paperboard and ground wood pulp products. New owner is forming a subsidiary, Androscoggin Paper & Pulp Corp., to operate plant for increased output.

Diver Mfg. Co., Naugatuck, Conn., has been organized by Arthur H. and Edward J. Diver, 193 Elm Street, to manufacture iron, steel, brass and other metal specialties.

Bonafide Mills, Inc., Winthrop, Me., manufacturer of composition floor coverings, with headquarters at 34 Thirty-fourth

TIGHT FOR 8 YEARS

...what a TANK!



Sulphuric acid pickling tank constructed of long leaf yellow pine timbers with Monel Metal tie-rods, lugs, washers and nuts. Built for the Petroleum Iron Works, Sharon, Pa., by Hauser-Stander Tank Co., Cincinnati, Ohio. This tank with 8" wall timbers has inside measurements of 30" wide x 10 ft. 6" deep by 32 ft. long.

And it looks good for 8 years more, thanks to tie-rods, lugs, washers and nuts all of MONEL METAL

IT'S hard enough to make a pickling tank that's tight in every seam and joint on the day it's built.

It is quite another matter to build one that is still tight and leak-proof after 8 years of pickling with sulphuric acid . . . and still good for many more years on the same job.

Hauser-Stander Tank Co. of Cincinnati did just that when they built the tank shown above . . . did it by precision planing of each and every timber. The finished timbers are not only squarely true in section, but the faces are plane and flat for their entire length. Opposite faces are parallel throughout. This means the tank can be first

assembled acid tight with minimum rod tension. Acid cannot leak between the joints to start undermining their integrity. Then they used tie-rods, lugs, washers and nuts all of rolled Monel Metal.

Monel Metal is so tough and so strong that tie-rods of this Nickel alloy can be "taken up" if necessary later after a drying period without fear of stripping the threads or of stretching the rods.

And Monel Metal so stubbornly resists the action of both acid and alkali pickling baths, whether hot or cold, that Monel Metal tie-rods are often salvaged from old tanks and used over again on new ones.

We shall be glad to send you actual reports, not only of Monel Metal tie-rods, but also of Monel Metal pickling baskets, that demonstrate the kind of gruelling conditions this equipment can stand. Just drop us a line.

THE INTERNATIONAL NICKEL COMPANY, 67 Wall Street, New York, N. Y.



Monel Metal is a registered trademark applied to an alloy containing approximately two-thirds Nickel and one-third copper. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.



Monel Metal

PIG IRON

five established brands

Federal Iroquois Perry

Toledo Zenith

COKE

Foundry, Industrial and Domestic

Chicago Solvay

Milwaukee Solvay

Perry Toledo

Waukegan

Zenith

All Lake Superior grades of

IRON ORE

By-product and Steam

COAL

Pickands, Mather & Co.

Cleveland - Chicago - Detroit - Erie - Toledo

Minneapolis - Duluth

Street, Brooklyn, N. Y., has approved plans for additions, including one two-story unit, 50 x 100 ft.; three one-story units, 100 x 200 ft., and two, about 50 x 50 ft., each. Cost about \$150,000 with equipment.

Wehle Brewing Co., Campbell Avenue, West Haven, Conn., has let general contract to Mott Construction Co., 440 Elm Street, New Haven, for two-story addition, 50 x 60 ft. Part of unit will be used for storage and distribution. Cost about \$40,000 with equipment. Brown & Von Beren, New Haven, are architects.

Auto-Springs, Inc., Springfield, Mass., has been organized by Donald W. Tuttle and William H. Davenport, 16 Hannon Street, to manufacture steel springs.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until

April 12 for one 20-in. motor-driven drill (Schedule 4662) for Portsmouth, N. H., Navy Yard; four motor-driven screw-cutting lathes and spare parts for Portsmouth yard, and one such lathe for Mare Island yard (Schedule 4625).

◀ OHIO AND INDIANA ▶

Manufacturers Steel Supply Co., 368 South Erie Street, Toledo, Ohio, iron and steel products, has plans for new one-story plant, 120 x 150 ft., in part for storage and distribution. Cost about \$50,000 with equipment.

Forbes Varnish Co., 3800 West 143rd Street, Cleveland, has let general contract to Alger & Knowlton Co., 2138 Lee Road, for one-story addition, 51 x 132 ft. Cost

about \$45,000 with equipment. Charles B. Rowley & Associates, Keith Building, are architects.

Exclusive Crystal Machine Co., Columbus, Ohio, has been organized by A. E. and Z. M. Krauss, care of Willis H. Leggett, Ohio State Savings Building, representative, to manufacture special machinery and equipment.

Wilson & Bennett Mfg. Co., 6532 South Menard Avenue, Chicago, manufacturer of steel barrels, drums and kindred products, has acquired business of Ohio Pail Co., Middlefield, Ohio, manufacturer of steel pails, drums, etc., and will consolidate with plant at Chicago. Production will be discontinued at Middlefield plant, which will be used as storage and distribution branch.

Material Division, Air Corps, Wright Field, Dayton, Ohio, will receive bids until April 8 for aluminum alloy tubing (Circular 609); until April 9, two turret punches, 28-in. throat (Circular 606), 95 cowlings assemblies and 95 gun camera adapter assemblies (Circular 622); until April 10, 2450 surface control bolts (Circular 627), 7500 tube clamps, 700 conduit covers, 500 conduit elbows, 200 conduit tees (Circular 619), 31,500 self-locking nuts (Circular 624); until April 11, 1000 landing gear strut ball joints (Circular 629), 28,000 ft. control cable castings (Circular 603), four engine units (Circular 626); until April 15, 50 generator sets (Circular 615), eight wheel and brake assemblies (Circular 604); until April 18, sea anchor windlass assembly and sea anchor release assembly (Circular 612); until April 19, five to 25 position computers (Circular 613), 1100 aircraft storage batteries (Circular 607).

Lion Electrical Appliance Corp., 1735 West Diversey Parkway, Chicago, manufacturer of electrical appliances and equipment, has acquired former factory of Pitkin & Brooks Co., Valparaiso, Ind., and will remodel for new plant.

◀ WESTERN PA. DIST. ▶

Arthur J. Palmer Co., Grove City, Pa., recently organized by Arthur J. Palmer, Jr., Grove City, and associates, has leased local factory and will remodel for manufacture of metal specialties, metal-plated ware, etc. Mr. Palmer was formerly connected with August Wendell Forge, Inc., Grove City.

Superintendent of Industries, Federal Prison, Lewisburg, Pa., will receive bids until April 8 for 12,000 iron rivets, 6000 stove bolts, etc. (Schedule 23).

Board of Education, Franklin, Pa., plans manual training department in new multi-story junior high school. Cost about \$300,000. Lawrie & Green, Third and Forster Streets, Harrisburg, Pa., are architects.

Interstate Amiesite Co., Inc., duPont Building, Wilmington, Del., plans new plant at Dunbar, near Connellsville, Pa., for production of rock asphalt, amiesite and kindred products. Storage and distributing division will be built, with loading, conveying and other machinery. Cost about \$75,000 with equipment.

◀ MICHIGAN DISTRICT ▶

White Star Refining Co., 903 West Grand Boulevard, Detroit, plans new bulk oil storage and distributing plant on 14-acre tract near Muskegon, Mich. Facilities will be arranged, including pipe lines, for both rail and water shipments. Cost about \$125,000 with equipment.

Chrysler Corp., 341 Massachusetts Avenue, Detroit, plans addition to plant of Dodge Brothers Corp., Hamtramck, a subsidiary, for commercial car production. Cost about \$250,000 with equipment.

Stroh Brewery Co., 909 East Elizabeth Avenue, Detroit, has let general contract to P. H. Piper, Michigan Theater Building, for one-story addition for storage and distribution. Cost over \$30,000 with equipment.

Controlled Atmosphere Oil Burner Co., Detroit, has been organized by George F. Rooke, 3027 David Stott Building, and associates, to manufacture oil burners and oil-burning equipment.

Michigan Bumper Co., Grand Rapids, Mich., recently organized to take over

STAINLESS

*on the side
that is used*
—MILD CARBON STEEL
ON THE OTHER

For all industries where manufacturing processes demand the use of stainless metal, as well as in those industries where its use would insure an improved product, and lower manufacturing costs, IngAclad meets practically every requirement.

ING A CLAD

STAINLESS-CLAD STEEL

Trade Mark Reg.

Write for special IngAclad folder, and free "Manual of Welding and Fabricating Procedures" for IngAclad Stainless-Clad Steel.

INGERSOLL STEEL & DISC CO.
DIVISION OF BORG-WARNER CORPORATION
Specialists in High Carbon, Alloy and High Speed Steel and Stainless-Clad Sheets.
310 South Michigan Avenue, Chicago, Ill.
Plants: Chicago, Ill. and Newcastle, Ind.

Pacific Coast Representatives:
Simonds Machinery Co.,
816 Folsom St., San Francisco
523 East 4th St., Los Angeles

Eastern Representatives:
H. Boker & Co., Inc.,
101-103 Duane St., New York, N. Y.

Ohio Representatives:
The E. W. Buschman Co.,
626 Broadway, Cincinnati, Ohio

Missouri Representative:
Clark P. Schumacher,
3740 Washington Ave., St. Louis, Mo.

*"A
Borg-Warner
Product"*

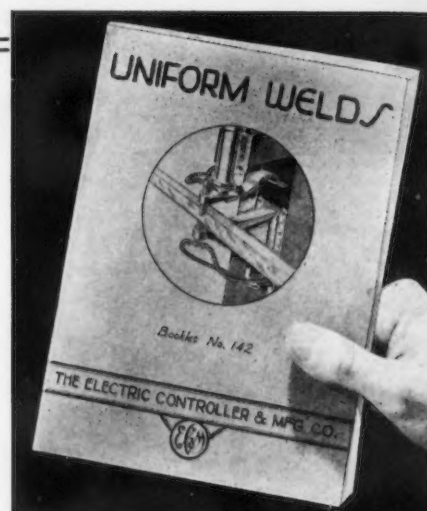
A New Booklet on Resistance Welding

(Spot, Butt and Projection)

FREE
to
manufacturers
or their
representatives

THIS BOOKLET TELLS

- WHAT causes poor welds
- WHAT metals are weldable
- WHAT size electrode and pressure to use with different thicknesses of metals
- HOW the resistance welding method originated
- HOW the welding machine operates
- HOW EC&M Auto-Weld Timers function
- WHY some metals do not weld easily
- WHY various welding methods are used



Now available . . . in a new 24-page booklet, just off the press . . . modern, up-to-date facts on spot, butt and projection welding—conveniently compiled for quick reference. We know the data, expressed in a non-technical manner, and the simplified illustrations contained in this handy booklet, will prove extremely useful and helpful to every manufacturer employing or contemplating the resistance welding method of fabrication. This booklet is offered absolutely free to manufacturers or their representatives. Merely fill in and mail the convenient coupon for your copy. Only a limited supply has been printed—better mail coupon today.

THE ELECTRIC CONTROLLER & MFG. CO.

2712 East 79th St., CLEVELAND, OHIO

Gentlemen:—

Please send me your new booklet containing useful data and facts on Resistance Welding. I understand this places me under no obligation.

NAME

COMPANY

ADDRESS
I.A. 4-35

Wolverine Bumper & Specialty Co., Grand Rapids, plans expansion and improvements, including additions and installation of equipment. Cost over \$100,000 with machinery. Albert P. Crell is president.

Mueller Brass Co., Port Huron, Mich., maker of valves and other brass and copper specialties, was recently incorrectly reported in these columns, as planning erection of one-story addition. No definite plans have been made. Company is in no way affiliated with Electric Auto-Lite Co., Toledo, Ohio, as stated in previous item.

◀ MIDDLE WEST ▶

Galena Distillery Co., Galena, Ill., has plans for one-story and basement addition, 40 x 100 ft. Cost about \$35,000 with equipment.

Swift & Co., Union Stock Yards, Chicago, have let general contract to John E. Ericsson Co., 123 West Madison Street, for new one-story plant, to replace a unit recently destroyed by fire. Cost about \$35,000 with equipment.

Home Foundry Mfg. Co., Chicago, has been organized to manufacture iron and other metal castings, and will take over Home Foundry Toy & Novelty Casting Co., with plant at 2983 West Madison Street. The incorporators include Meyer and Herman Rapaport.

Board of Trustees, State Training School, Plankinton, S. D., plans new steam power plant for central heating service. Appropriation of \$30,000 has been authorized. Charles Trimmer, State House, Pierre, S. D., is State engineer in charge. A. R. Schlosser is superintendent.

Construction Service, Veterans Administration, Washington, asks bids until April 16 for steel shelving for group of 15 buildings at institution at Danville, Ill.

Minnesota Valley Canning Co., LeSueur, Minn., food products, plans extensions and improvements in branch plant at Winthrop,

Minn., including new equipment. Cost close to \$30,000 with machinery. Ralph W. Richardson, 116 East Fourth Street, St. Paul, Minn., is consulting engineer.

Pointer Brewery Co., Clinton, Iowa, has filed plans for one-story addition. Cost about \$30,000 with equipment.

Board of Public Works, Sheboygan, Wis., has commissioned Jerry Donohue Engineering Co., local, to design new sewage disposal plant and intercepting sewer system, contemplated as PWA project and estimated to cost \$1,125,000.

Fairbanks, Morse & Co., Beloit, Wis., have placed contract with Cunningham Brothers, 400 East Grand Avenue, for an addition, 62 x 120 ft., to main works on Lawton Avenue.

Board of Vocational Education, Wisconsin Rapids, Wis., has engaged Houghton & Henderson, local architects, to plan addition, 87 x 116 ft., one-story, to vocational training institute, W. A. Sprise, director. Cost about \$40,000 with equipment.

Municipal Water & Electric Commission, Shawano, Wis., will take bids about April 15 for rebuilding steam generating plant and making two-story addition, 52 x 110 ft., to provide also for municipal garage and fire department headquarters. Blain Page is superintendent.

◀ SOUTH CENTRAL ▶

National Distillers Products Corp., 120 Broadway, New York, and Frankfort, Ky., plans early call for bids for extensions and modernization of distillery at Frankfort, recently acquired from W. A. Gaines & Co. Cost over \$85,000 with equipment. Sanderson & Porter, 52 William Street, New York, are engineers.

City Council, Alexandria, La., asks bids until April 23 for two 500-hp. watertube boilers with superheaters and accessories, desuperheater and other equipment for municipal electric light and power plant.

Buckeye Cotton Oil Co., Memphis, Tenn., has let general contract to F. V. Ragsdale, Derron Building, for one-story addition, about 64,000 sq. ft. floor space, primarily for storage and distribution. Cost about \$70,000 with equipment. Company is a subsidiary of Procter & Gamble Co., Cincinnati.

Board of Public Works, Nashville, Tenn., plans early call for bids for furnaces, mechanical-handling and other equipment for new municipal incinerator plant. Cost over \$75,000 with machinery. C. N. Harub Engineering Co., American National Bank Building, is consulting engineer.

◀ SOUTH ATLANTIC ▶

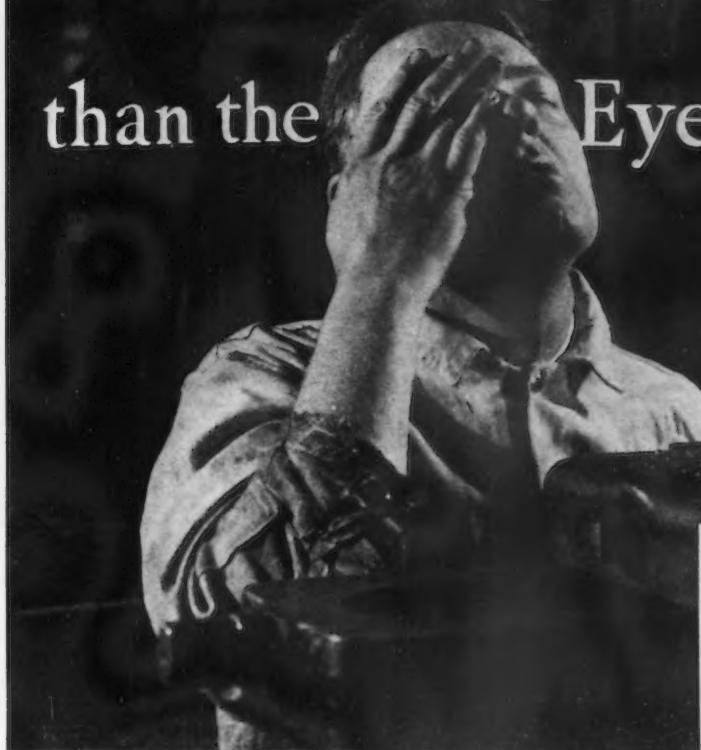
Lyons Fertilizer Co., Third Avenue and Thirty-fourth Street, Tampa, Fla., has let general contract to W. M. White Construction Co., Stovall Professional Building, for one-story plant, 120 x 300 ft., to replace works recently destroyed by fire. Cost about \$100,000 with equipment. Byron E. Bushnell, 305 Morgan Street, is engineer.

United States Engineer Office, Jacksonville, Fla., asks bids until April 8 for two cast carbon-steel runners, with steel plate mouth liners (Circular 840); until April 10, 21-in. cast-steel flap valves, one cast carbon steel 23-in. suction pipe gate valve, one cast carbon steel suction pipe ball and socket joint, and other suction pipe castings and patterns (Circular 847).

Georgia Granite Corp., Elberton, Ga., let general contract to W. M. Smith Construction Co., 4601 First Avenue North, Birmingham, for one-story plant unit, 54 x 620 ft., all-steel type, to be used in part for storage and distribution. Cost over \$50,000 with mechanical-handling and other equipment.

Board of Greenwood County Commissioners, Greenwood, S. C., will soon begin erection of new hydroelectric generating plant on Saluda River, near Buzzards

The Chip is *Quicker* than the Eye



EYES FLY SHUT against danger. But chips fly *faster* . . . pierce workers' eyes *and raise production costs.*

How much *do* eye injuries cost? In compensation alone, a blinded eye costs from \$1800 to \$2500. Add the hidden costs—medical and hospital expenses, lost time and production delays—and the price of a single sightless eye would buy a new production machine. *It would buy the best eye protection for 1000 men—AO goggles.*

Even minor eye injuries cost far more than the goggles that would have prevented them.

AO goggles include types that protect against every known eye hazard. Exactly fitted to the needs of the man and the job, they allow full vision, give complete and comfortable protection. Like good production tools, they

Protect SIGHT and *Dollars* with AO GOGGLES

are an aid to quick, efficient work. The industrial representative stationed at the AO branch office near you will be glad to work with you on a practical, profitable eye-safety program for your plant. Call him in.



For many jobs such as running lathes, drills and automatic screw machines, the AO open-frame goggle shown above provides efficient protection. Cool and comfortable as ordinary spectacles. The Super Armorplate lenses give clear, accurate vision and provide maximum resistance to impact. *Super Armorplate lenses are patented.*

American Optical Company

Manufacturers, for more than 100 years, of products to aid and preserve vision. Factories at Southbridge, Mass. In Canada, Consolidated Optical Co., Ltd. Branch offices in all principal industrial centers

1566

THE IRON AGE, April 4, 1935—83

THIS BELT

**Runs true —
Remains flat —
Does not distort
and is completely flexible**

Made in all proven metals. Ideal for washing, drying, baking, annealing and other severe process conditioning uses requiring treatment at elevated temperatures.



U. S. Patent
No. 1,952,873

WICKWIRE SPENCER STEEL COMPANY

New York City Worcester Buffalo Chicago San Francisco

**WISSCO
CONVEYOR BELTS**

Send for the
New Conveyor
HAND BOOK



Roost, including dam, power house, spillway and other structures. About 110 miles of transmission and distributing lines will be built, with substations and switching stations. Fund of \$2,627,000 has been secured through Federal aid. Daniel T. Duncan is engineer.

◀ WASHINGTON DIST. ▶

General Purchasing Officer, Panama Canal, Washington, asks bids until April 9 for 10,000 lb. soft steel wire, 7500 ft. copper wire, cable, magnet wire, heater cord, galvanized steel seizing strand, galvanized steel wire cloth, 164 tackle blocks, 800 chain shackles, sheathing nails, sheet brass grommets, knife switches, toggle switches, circuit breakers and other equipment (Schedule 3043); until April 12, six pneumatic hoists, twist drills, chain bolts, tinners' snips, vises, oil circuit breakers, 20,000 ft. rubber-insulated cable, wood screws, files, flashlights, reflectors and other supplies (Schedule 3045).

Allegany County Board of Education, Cumberland, Md., plans manual training department in new multi-story junior and senior high school, for which bids have been asked on general contract. Cost over \$500,000. Robert H. Hitchins, 103 Baltimore Street, Cumberland, is architect.

Board of District Commissioners, District Building, Washington, asks bids until April 22 for unit No. 2 of sewage treating plant, including grease separating tanks, sedimentation tanks, plant by pass and other equipment. An appropriation of \$900,000 has been arranged for project. Metcalf & Eddy, Statler Building, Boston, are consulting engineers.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until April 16 for special tools and wrenches, steam whistles and spare parts for Eastern and Western navy yards (Schedule 4614).

◀ SOUTHWEST ▶

Board of Public Service, City Hall, Bridgeton, Mo., will soon take bids on general contract for one-story addition, 42 x 100 ft., to United States Naval Reserves hangar at Lambert-St. Louis Airport, for repairs, reconditioning, etc. Cost over \$50,000 with equipment. W. C. E. Becker is city engineer.

City Council, Little Rock, Ark., plans early call for bids on general contract for new one-story hangar at municipal airport,

with shop and reconditioning facilities, in conjunction with new administration unit. Cost about \$75,000 with equipment. Thomas Harding, Donaghey Building, is architect.

Common Council, La Plata, Mo., has secured permission to erect new municipal electric light and power plant. Electrical distribution system will also be built. Fund of \$97,350 has been secured through Federal aid. E. T. Archer & Co., New England Building, Kansas City, Mo., are consulting engineers.

City Council, Liberty, Tex., plans new municipal electric light and power plant, including distribution system. Cost about \$125,000. Garrett Engineering Co., 300 Hughes Street, Dallas, Tex., is consulting engineer.

Big Three Welding Equipment Co., Fort Worth, Tex., has been organized by C. E. Rickel and Benjamin K. Smith, 4129 Pershing Street, to manufacture welding equipment and kindred products.

◀ PACIFIC COAST ▶

Board of Education, 1151 South Broadway, Los Angeles, has asked bids on general contract for two additions to Manual Arts High School. Cost over \$75,000 with equipment. John and Donald B. Parkinson, Title Insurance Building, are architects.

Allan Cutler, Inc., 2065 Cowper Street, Palo Alto, Cal., plans new food products canning plant on 12-acre tract at Mountain View, Cal., with main one-story unit, 300 x 500 ft., steam power house for processing service, and other units. Cost over \$200,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until April 12 for one steel tank, 188 in. long, 84 in. wide, 52 in. deep on one end and 46 in. deep on other (Schedule 4639) for naval station at Hawthorne, Cal.; until April 16, 12,000 ft. steel wire rope for San Diego Navy Yard (Schedule 4652).

Stuart Oxygen Co., Ltd., 211 Bay Street, San Francisco, manufacturer of industrial oxygen, has plans for new one-story plant, 46 x 138 ft. Cost about \$30,000 with equipment. Ellison & Russell, Pacific Building, are consulting engineers.

Century Brewing Co., 3100 Airport Way, Seattle, has let general contract to A. W. Quist Co., Exchange Building, for four-story addition, 53 x 85 ft. Cost about \$100,000 with tanks, vats and other equipment. Joseph Wohleb, Olympia, Wash., is

architect; W. H. Witt Co., Lloyd Building, Seattle, is consulting engineer.

Bureau of Reclamation, Denver, asks bids until April 15 for three water gages for installation in forebay, tailrace and gaging station respectively, Boulder power plant, Boulder Canyon Project, Arizona-California-Nevada (Specification 672-D).

Master Oil Burner Co., 3674 Fourth Street South, Seattle, manufacturer of oil burners and oil-burning equipment, is considering one-story addition, 100 x 200 ft. Cost over \$50,000 with equipment.

◀ FOREIGN ▶

Commercial Solvents Corp., 230 Park Avenue, New York, manufacturer of industrial chemicals, has begun work on branch plant near Liverpool, England. A fermentation unit will be built for production of solvents from molasses. Plant is scheduled for completion in fall. Cost over \$500,000 with machinery.

Boots Pure Drug Co., Ltd., Beeston, Nottingham, England, manufacturer of drug and chemical products, has approved plans for multi-story plant addition. Cost close to \$2,000,000 with equipment.

Tubize Chatillon Corp., 2 Park Avenue, New York, manufacturer of viscose rayon products, is considering erection of new mill at Sao Paulo, Brazil. Plant will include power house, machine shop and other mechanical departments. It is proposed to remove certain machinery from mill at Hopewell, Va., closed last year, to new location. Cost over \$500,000 with machinery. Raymond B. Burrows, Hopewell, is plant manager.

Ilova Sugar Estates, Ltd., Natal, South Africa, is planning extensions and improvements in cane sugar mills, with installation of grinding and other machinery. Cost close to \$500,000 with equipment.

Purchase of the entire assets of the Werra Aluminum Co., Waukesha, Wis., in receivership, by a group of Waukesha business men represented by Charles E. Nelson, of Waukesha, has been approved by the Waukesha County Court. The bid of \$5,000 was uncontested at receiver's sale. A new corporation will be organized to take over and continue the operation according to recommendations of industrial engineers who some time ago made a survey. The Werra company is one of the few aluminum foundries in the United States equipped to handle large work. It was established in 1912 by Conrad Werra, pioneer in the aluminum casting industry, who is to be retained by the new corporation in a consulting capacity.

Westinghouse Electric & Mfg. Co. has been awarded by the Bureau of Reclamation contract amounting to \$500,000 for four oil circuit breakers and accessory equipment for installation at the Boulder Dam generating station. Production will begin immediately at the East Pittsburgh works, and shipment of the equipment will be made next fall.

The International Harvester Co., Chicago, had net income for 1934 of \$3,948,637, equal to \$4.16 a share on its outstanding preferred stock. This is in contrast to a net loss of \$1,886,257 in 1933 and a loss of \$7,582,879 in 1932.

Put Exide-Ironclad Batteries to work



CUTTING COSTS

When you install an Exide-Ironclad in an electric industrial truck, you can count on getting more materials handled in less time. These batteries are almost tireless. They can handle unusual loads and climb steep grades—and still maintain good speeds. They cut down interruptions in the service with their sustained power and freedom from trouble.

Exide-Ironclads are economical to operate. They cut maintenance costs, and by maintaining their efficiency throughout their long life, they consistently save you money.

The construction of Exide-Ironclad positive plates is unique. Slotted rubber tubes retain the active material, while exposing it freely to the electrolyte. Another exclusive feature is the new Exide Mipor Separator—the permanent storage battery plate insulator.



Improve your materials handling service and cut costs with Exide-Ironclad—a good battery made still better. Write for booklet, "Facts for Consideration in Selecting a Battery."

THE ELECTRIC STORAGE BATTERY CO., Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

Exide IRONCLAD BATTERIES

WITH EXIDE MIPOR SEPARATORS

"MIPOR," Reg. U. S. Pat. Off.

THE IRON AGE, April 4, 1935—85

PERKINS MAN COOLER



PERKINS MAN COOLER blows heat away. Because cold air is not introduced from the outside, its invigorating breeze does not chill. It produces refreshing recirculation of air of the same temperature in which the men are working.

**B. F. PERKINS & SON, Inc., HOLYOKE, MASS.
ENGINEERS AND MANUFACTURERS**

How to Bring Out New Products

(CONTINUED FROM PAGE 31)

is that the company had the largest Christmas sales in its history. With total assets of more than \$2,000,000, with \$920,000 in current assets, \$400,000 in liquid assets and \$500,000 in cash and ac-

counts receivable as of Jan. 1, 1935, the courts felt justified in returning this previously bankrupt concern to its owners. Mickey had worked a miracle. He had restored a manufacturer who was in re-

ceivership to financial health in a few months.

It is easy to explain that coup. The Lionel Corp'n. stuck to its line. Instead of packing cranberry juice or going into some other business that it knew nothing about, it continued in the field it knew well—toy trains. All it did was to pep up its old line by adding a popular novelty to it.

Mickey Mouse Repeats

The Ingersoll Waterbury Co. had a similar experience. This concern also had been in financial difficulties. An enterprising new management was pulling the organization out of its troubles nicely, when they thought of placing a Mickey Mouse on the dials of their children's line of watches and clocks. Presto, the company made money hand over fist. As a result, 1934 turned out to be one of the most profitable years in its history.

More than sixty companies have been licensed to use Mickey Mouse on their merchandise. Not all of these businesses have made the killing with the character that Lionel and Ingersoll did. In every case, however, where the Mickey Mouse product was a logical addition to the manufacturer's previous line, the venture has justified the payment of a royalty to Walt Disney.

But here's a story that has no connection with Mickey Mouse. It is the best example that I have run into in a long time of the seizure of an ideal situation for launching a new product. I refer to the Stanley Works, New Britain, Conn., one of the largest manufacturers in the world of hinges, rules, levels, garage hardware, electrical tools and scores of similar things. Though the number of products that it makes runs into the hundreds, still the company is always willing to add new lines if their manufacture does not conflict with organization policies and if they look sufficiently promising from the marketing standpoint.

Stanley Works Seize a Situation

Believing that it found such a line, Stanley added toys to its family in the spring of 1933. It brought out the Stanlo toy. This is a construction toy of a unique type. The basic unit is a hinge butt. Fasten two pieces together with a rod and



The facilities of **J&L Warehouses** form an important part of Jones & Laughlin service. Extensive stocks, placed at strategic points, await *immediate* shipment. You may have a single bar or a large lot, according to your need. Every

piece is of known quality; you get exactly the steel you want, without substitution. Each **J&L Warehouse** is a big institution localized. It welcomes orders small and large, and fills them with speed, intelligence and economy.

Write for a copy of the Combined Stock List for J & L Warehouses

JONES & LAUGHLIN STEEL CORPORATION

AMERICAN IRON AND STEEL WORKS
JONES & LAUGHLIN BUILDING, PITTSBURGH, PENNSYLVANIA



J&L WAREHOUSES

CHICAGO—Main 2324
 VIRGINIA—1600
 CINCINNATI—Main 2324
 DETROIT—Plaza 0470
 NEW ORLEANS—Franklin 1131
 PITTSBURGH—Hemlock 1000
 LOUISVILLE—Magnolia 1693 . . . Stock of Bars for Concrete Reinforcement and Bar Fabricating Yard
 MEMPHIS—6-4836 . . . Distributing Warehouse for Pipe, Sheets, Spikes and Wire Products. Reinforcing Bar Warehouse and Fabricating Shop

**J&L
STEEL**

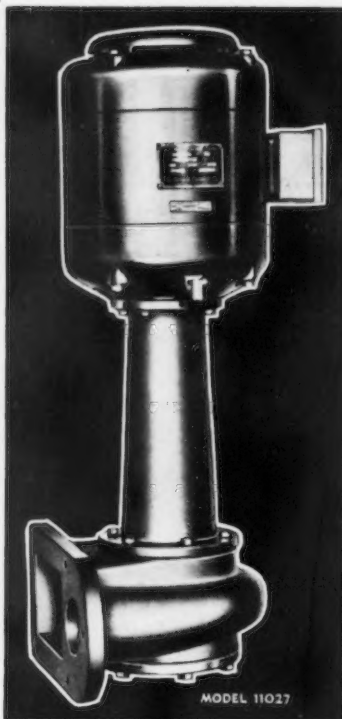
For Every Need . .
the Right Quality
of Steel in a Full
Range of Sizes

THE OUTSTANDING COOLANT PUMP—

Built in two models having a capacity in excess of 150 G.P.M. Simplicity of its design is seen in the absence of packing nuts, foot valves, relief valves and strainers. No metal-to-metal contact within the pump. Thrust of twin suction impeller balances the weight of the vertical shaft. Large ball bearings sealed high and dry in the motor. Built in 1/4 H.P. to 3 H.P. Sizes.

Your machine tools deserve such a coolant pump.

THE RUTHMAN MACHINERY CO.
CINCINNATI OHIO



you have a hinge. The Stanlo construction set consists of plates, rods and wheels. The plates come in squares, rectangles and triangles in different sizes. There are loops surrounding the edges of the plates. The plates are so graduated that two pieces of a smaller plate will fill a full side of the next larger plate. There is almost no limit to the things that can be made with these units. Already have been built houses, furniture, automobiles, trolley cars, boats, factories, churches, forts, bridges, railroad stations, semaphores, signals, dice and numerous other articles. Each day is adding to the list.

This toy is a French invention, patented both in the U. S. A. and abroad. It has been on the market in France for some time, where it has been notably successful. A few large toy dealers in the United States had been importing the article. So deeply impressed were the Stanley Works with the record that had been achieved on this toy and with its possibilities for further sales development that the company decided to acquire the American rights to it.

These are the main factors that influenced the concern in coming to this decision:

1. The manufacture of the toy would enable the company to

utilize considerable of its hinge-making machinery, of which it had a surplus.

2. The toy would consume large quantities of strip steel, another product which the Stanley Works makes.

3. A further division of the organization is the Stanley Chemical Co., a producer of lacquers, varnishes and similar materials. The toy would furnish the company with a controlled market for these finishes.

4. Since it was already in the hinge business, Stanley had many of the necessary dies and tools for the construction of the toy. It also had an abundance of factory space available, and, just as important as any of the other advantages, it had trained workmen.

5. The final consideration is that the Stanley tools and the Stanley hardware are used mainly in the building industries. What was more logical, therefore, than for the company, if it was determined to go into the toy business, to select a construction toy?

Another consideration that had a bearing on the decision was the fact that this distinctive metal construction toy was patented. Stanley might be entering a new and highly competitive field, the toy business, but it had something different to offer than had ever been put before the American market and a patent to protect the

new business that it might expect to develop over a period of years.

No New Capital Investment

Best of all, it was only an opportunity that this famous New Britain manufacturer could seize with a reasonable assurance of success. For any other manufacturer to attempt to enter cold into the production of construction sets of this type would be a hazardous undertaking. The investment in plant facilities and in equipment and in gaining the specialized experience necessary to make this product would have run up the capital investment to such a figure that it would be a long time before any returns could reasonably be expected on the investment. The Stanley Works, on the other hand, were obliged to make virtually no new capital investment. Because of the peculiarly advantageous combination of conditions already mentioned, the toy was added as just another Stanley product.

About the only thing that the company lacked for its new venture was a knowledge of the toy business. This handicap applied only to the marketing end of the business. As far as production is concerned, the Stanley Works probably know more about the fabrication of steel strip into hinges than any other concern in the world, and, as already explained, that is the essential basis of the manufacture of this toy.

Even on the marketing side, it did not take the company long to accumulate a vast fund of data about selling toys. With the thoroughness that characterizes all its efforts, the very first thing it did was to start a comprehensive survey of the toy markets in the United States.

The market investigation revealed that the French toy would have to be altered in several respects. The French set was put together so that a child could build churches, castles, forts and such structures. The American boy wants to make a much larger variety of things—buildings of every description, mechanical devices and God-only-knows-what. So the Stanlo toy has been given vastly greater elasticity than the French toy. The number of structures that can be made with it is limited only by the imagination of the builder. Already hundreds of things have



6 REASONS WHY TOOLMAKERS ARE ADOPTING **MoTUNG**

THE NEW HIGH SPEED STEEL

1. Easier to machine.
2. Lower temperatures for heat treatment.
3. It is tougher.
4. It is economical.
5. It is stable in price and supply.
6. Performance proved equal to or better than 18-4-1.



THE NEW HIGH SPEED STEEL

presented by

UNIVERSAL STEEL COMPANY

BRIDGEVILLE, PA.

AND CYCLOPS STEEL COMPANY

TITUSVILLE, PA.

Manufacturers of all grades of Tool Steels, Stainless Steels, and special Carbon and Alloy Steels.

Sales Offices: Chicago • Cleveland • Detroit
Hartford • Indianapolis • Los Angeles • Milwaukee
Norfolk • New York • Philadelphia • Pittsburgh
San Francisco • St. Louis • Syracuse • Toronto
Washington • Worcester

Warehouses: Bridgeville • Titusville • Chicago
Detroit • Worcester

MoTUNG, the molybdenum-tungsten high speed steel recently presented by Universal Steel Company and Cyclops Steel Company, is the culmination of metallurgical research begun as early as 1896.

Now thoroughly practical with a patented formula which provides a proper balance of composition, this brand of **MO-MAX** High Speed Steel comes to the trade recommended by scores of users over a period of three years.

It is our desire that **MoTUNG** be prepared properly and thus show the marked savings in time and cost which are obtainable. We suggest cooperation along these lines.

Ask your tool manufacturer for **MoTUNG** tools or write us for the new **MoTUNG** Booklet No. 104.

MoTUNG, a brand of **MO-MAX** High Speed Steel, is available through any of the offices or warehouses listed at the left.

⊕ 1073

THE IRON AGE, April 4, 1935—89

FOR CONTROL OF LOW PRESSURE AIR



Style "D" illustrated above is made with American standard drilled flanges and fitted with slide rod stuffing box. It is air-tight, being tested up to 80 lbs. pressure against leakage to the outside.

M & P IMPROVED BLAST GATES

offer a wide range of types and sizes for controlling the blast to forges, furnaces and cupolas, for regulating the flow of air to dryers, ovens and kilns, and for other purposes which require low pressure air.

They are strong, carefully made, compact and easy to operate. The slide may be opened any amount desired and will remain in the position set, assuring positive control.

The pipe connections are designed either for standard sheet metal pipe, tapped for standard threaded pipe or provided with drilled flanges for flanged pipe connection.

We shall be glad to send you a copy of our bulletin No. 351 giving complete details. The dimensional data it contains will be found useful in layout work.

FARREL-BIRMINGHAM COMPANY, INC.

100 Main St., Ansonia, Conn.

been built and each day Stanlo fans are devising new articles that can be made with the construction set. It appreciated that in a construction set it is an advantage to have a number of colors. A boy will be much more satisfied with a structure that he builds if he can work a lot of brilliant hues into it. Hence the Stanlo toy contains a sufficiently large variety of colors to gratify the most color-hungry youngster.

Modern Packaging

A considerable change has also been made in the Stanlo package. The French package, while beautiful, was altogether too idealistic for this country. It portrayed ideal structures that could not actually be made with the set. If this package were offered widely in the United States boys would be sure to let out a mighty holler as soon as they found that the things shown on the package were imaginative. Thus the carton container which the Stanley Works have created is practical. Every structure depicted on it can be made with the materials inside. At the same time it possesses all the artistic values of a good package.

An unexpected consequence of the introduction of this toy into the business of the Stanley Works is the effect it has had on the com-

pany's employees. This concern's usual merchandise is rather prosaic. There is nothing about hardware to stimulate the emotions. The construction set is the first "pretty" thing that Stanley has ever manufactured. Seeing a stream of brilliantly colored and oddly shaped pieces of steel running through production has aroused the latent artistic impulses of even the humblest factory workers. The toy department has become the most popular division in the business. Many an employee who previously had been content with his job, making rules or levels or garden tools, has asked to be transferred to the toy section.

No new product that the company has ever added has interested the factory staff as much as this set. Men who spent their days tossing cases around the shipping room or adding up figures in the cost department or attending a punching press, have become great construction engineers over night. They sit up all hours making things with the set.

Employees Devise Applications

Some of them have devised truly amazing contraptions — creations that the management never even dreamed of when it got up a catalog suggesting typical structures that could be made with the set.

It is not only the elaborateness of the structures that these factory workers have built but also the engineering accuracy with which they are executed that astonish one. Men who never did anything more mechanically exacting than nail a cover on a box are now designing and putting together miniature structures that would do credit to the most experienced engineer.

For instance, a factory attache walked into the Stanley offices one morning with a replica of the aerial car mechanism that thrilled so many at the late Chicago World's Fair. The toy was true to the original in every proportion and down to every single detail. It was a brilliant piece of work for a man totally untrained in construction engineering. He had attended the Fair, and somehow had managed to get a copy of the architect's drawings of the aerial car. When he got back to New Britain, he set out to reproduce a miniature of the structure. He accomplished the feat in a few evenings, taking off from his regular employment only long enough to go to the office to present his masterpiece to his astonished employers.

But the Stanlo magnum opus so far is a Ferris wheel that actually revolves. It is run by a small electric motor. It is complete in all details, containing everything to be found in the familiar type of Ferris wheels. The wheel is made entirely from Stanlo construction set parts, except for the motor and attachments, which the creator had to buy separately. This structure was also the handiwork of a Stanley factory man, who never before realized that he had it in him to build such an elaborate bit of engineering.

It is merely a coincidence that all of the case histories I have cited concern children's merchandise. The same basic method of adding new products is followed by hundreds of well managed companies in all fields, Weston Electrical Instrument Corp., the Fafnir Bearing Co., General Motors Corp., the General Electric Co., the B. F. Sturtevant Co., the American Type Founders Co., Johns Manville Corp., etc. Run down the list of blue chip corporations and it will be found that most of them are careful to bring out only new products that are related to their fundamental lines.

Thomps
Speeds
Equipm

THIS leading
type of spec
wires, is an
that are sec
modern lubr
Plant exec
inding Gulf
profits. With
our plant c
ing Gulf's m
cost cutting
types.

If you are
discuss, in de
to improve th

GULF RE
District Sale
NEW ORLE

GULF

This operation shows the continuous automatic drawing of fine wire in the Thompson plant. The use of the right Gulf lubricants keeps this equipment in continuous operation.

Here, medium size wire is drawn through the dies by a powerful mechanism beneath the bench on which the spools of wire are located. Gulf lubricants protect this equipment.

GULF LUBRICANTS KEEP WIRE MAKING COSTS DOWN

*Thompson Wire Company, Worcester, Mass.,
Speeds Production and Protects Costly
Equipment with GULF QUALITY LUBRICANTS*

THIS leading wire making plant, specializing in the highest type of special wires, as well as the more common basic wires, is another in the long list of metal working plants that are securing lower operating costs through Gulf's modern lubrication plan.

Plant executives, faced with today's trying conditions, are finding Gulf lubrication an able ally in their battle to conserve profits. Without one-cent of additional capital investment, your plant can definitely reduce operating expenses by putting Gulf's modern lubrication plan to work. This scientific cost cutting plan can be successfully applied to plants of all types.

If you are not using Gulf products, we suggest that you discuss, in detail, with a Gulf engineer just what can be done to improve the lubrication and operation of your equipment.

GULF REFINING COMPANY, Pittsburgh, Pa.

District Sales Offices: BOSTON • NEW YORK • PHILADELPHIA • ATLANTA
NEW ORLEANS • HOUSTON • PITTSBURGH • LOUISVILLE • TOLEDO

For executives who are looking for a means of reducing their lubrication costs, we have prepared the brief treatise shown here. It will be sent on your request without obligation.



**INDUSTRIAL
LUBRICATION**



Above, we see the continuous drawing of medium size wire in the Thompson Wire Company's New England plant. Gulf lubricants keep all equipment operating at maximum efficiency.

GULF REFINING COMPANY
3800 Gulf Building, Pittsburgh, Pa.

I.A.—4

Please send me without obligation, the booklet "Lubrication Cost Recording."

Name.....
Title.....
Company.....
Address.....

Specify Weatherhead

The Better Manufacturers Do!



TUBE SERVICE PARTS—
ALL TYPES
IN STOCK

BETTER . . . STRONGER . . . Weatherhead Fittings are More Adaptable

For Free Catalog write
THE WEATHERHEAD COMPANY, 644 Frankfort Avenue, Cleveland, Ohio

up its foreign trade more than 50 per cent on the compensation and barter basis, this system seems to be its strongest weapon. The German industry, however, will not leave the cartel, but, in some way or other, they will seek a higher allotment.

Machinery Exports Higher

The machinery export trade is also reviving. Russian business is still very bad, as the German government is adhering strictly to her orders, that no export guaranties nor credits will be given until Russian indebtedness to Germany has fallen below 200,000,000 M., of which 50 per cent is covered by running deliveries from Russia to Germany. This point has just about been reached and it is probable this spring that Russian orders will again be placed in Germany. Machine tool exports to all other countries increased in quantity in 1934, as compared with 1933, by nearly 35 per cent, and a further rise has been noticeable in the first two months of this year.

German Pig Iron and Ferroalloy Output Much Higher—Steel Exports Maintained

HAMBURG, March 21 (*By Special Correspondence*).—German pig iron production in January was 880,499 tons, compared with 832,761 tons in December, and with 621,477 tons in January, 1934. Yet the number of blast furnaces is constantly decreasing. There are now only 148 furnaces in Germany, compared with 174 two years ago and with 202 five years ago. However, the combined capacity of the present 148 stacks is greater than that of the 202 of five years ago. There were 75 furnaces in blast in January.

Production of ferroalloys, including spiegeleisen, ferromanganese and ferrosilicon totaled 186,285 tons in January, compared with 170,980 tons in December, and was the highest in seven years. Proportionately, production of ferroalloys was never as large as it is today, whereas output of foundry iron, at 73,676 tons in January, was the lowest ever recorded in proportion to the total volume. January hematite production of 56,229 tons, however, was the highest in relation to the total output ever reported.

Exports Keeping Up

The German steel export business continues to be satisfactory.

The question of the Saar allotment has not yet been definitely settled. Last year the Saar sold 19 per cent of its production in France. This percentage either will have to be sold for export or Saar production will have to be curtailed, the latter possibility being remote. It is probable that an agreement may be signed with France concerning an exchange of steel up to 11 per cent of the Saar production against ores. A part of the Saar output will also likely find its way into Germany, even though the present German allotment is considered insufficient.

Germany has now established at Düsseldorf a special office for barter trading. This is probably the first step toward a complete segregation of the barter business.

The German steel industry will fight for higher cartel allotments this year, since last year it had to pay nearly \$600,000 to the cartel for excess shipments. In the first eight weeks of 1935 Germany had already sold 20 per cent of its 1935 allotment for export, and its difficulty is not to get business but to avoid it. Numerous orders from Scandinavia, the Baltic States and Latin America have been turned down.

Now that the industry has built

TRADE NOTES

General Supply Co., S. A., Calle Balderas No. 56-58, Mexico, D. F., has been appointed by Link-Belt Co. as its stock carrying distributor for conveying and power transmitting machinery in the Federal district and state of Mexico.

National Alloy Steel Co. of Blawnox, Pa., has appointed Horace T. Potts Co. of East Erie Avenue and D Street, Philadelphia, as district representative covering the sale of heat, corrosion and abrasive resisting castings in the Philadelphia and Baltimore territories.

The Horace T. Potts Co. was established in 1815.

George D. Miller Co., 2168 West 100th Street, Cleveland, has been appointed exclusive representative in Cleveland territory for W. F. & John Barnes Co., Rockford, Ill.

Aerial Machine & Tool Corp., New York, is moving to larger quarters at 260 West Street and will be permanently located at that address after April 1.

Fairbanks, Morse & Co., Chicago, had 1934 net earned income of \$563,847. In 1933 net loss amounted to \$1,147,340. Net sales in 1934 jumped to \$12,571,466 from \$8,907,925 in the previous year.

The New York Central has placed an order with the Timken Roller Bearing Co., Canton, Ohio, for bearings, main and side rods, and other reciprocating parts, to completely equip all driving axle crankpins of their new high-speed streamlined steam passenger locomotive, the Commodore Vanderbilt.

What a Wire

THIS HAS TO BE!



DO YOU enjoy the "feel" of a really fine specimen of tempered flat high carbon spring steel... steel with power and strength in it, yet smoothly flexible? Such a steel is this Roebling Flat Wire.

We make this wire to exacting specifications. It is highly flexible and resilient. Its temper is uniform and is kept within very close limits. It is straight throughout and of uniform thickness. The finishes in which it is available include black tempered;

tempered and polished; and tempered, polished, and colored.

This is but one of many cold-rolled steel flat wires which we make to meet special requirements as to temper, tensile strength, bending, forming and other qualities. Our organization is particularly well-equipped to handle this type of business, with special facilities and over 40 years of experience. Your inquiry regarding any of the types of Roebling Flat Wire listed would be welcome.



Roebling Cold Rolled Flat Wire is made from both high carbon and low carbon steels, produced in Roebling's own mills. The high carbon flat wire is available in tempered and untempered types.

Finishes:—bright, black annealed, bright annealed, tinned, japanned, galvanized, blued, strawed-colored, coppered.

JOHN A. ROEBLING'S SONS COMPANY
TRENTON, N. J. *Branches in Principal Cities*

ROEBLING Cold Rolled Steel **FLAT WIRE**

ONLY A FINE PRODUCT MAY BEAR THE NAME ROEBLING

INTRICATE



ACCURATE

WHEN intricate parts require accurate steels, you can rely upon B & L engineers to develop the proper grade to meet all conditions of the problem.

This eccentric shaft for a refrigerator unit is a typical example of a "tailored to order" steel with well balanced physical properties for economy in fabrication, as well as durability in service.

It represents a complicated machining operation, which calls for a free-cutting steel. Yet it must show adequate surface hardness to insure long wear life. Its extreme accuracy demands a steel which will permit of minimum distortion following heat treatment.

These requirements were met by applying 1314-X to the problem, and developing characteristics in the steel to insure machinability close to SAE 1112, plus ample toughness and hardness for exacting service hazards. Its fine record has justified its quality.

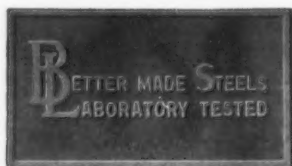
COLD DRAWN
BARS AND
SHAFTING

FREE-CUTTING
SCREW STOCK

SPECIAL
SECTIONS

ALLOY
STEELS

You may have a similar question in connection with your product—let us help you work out the answer.



We invite your inquiries on applications of Cold Drawn Steel for machine parts, shafting or bars.

BLISS & LAUGHLIN, INC.

HARVEY, ILL. Sales Offices in all Principal Cities BUFFALO, N.Y.

Gear Makers Submit Budget—Code News

WASHINGTON, April 2.—The code authority for the gear manufacturing industry had applied for NRA approval of a proposed \$9,000 budget of code expenses for the fiscal year ending March 31, 1935, and for permission to spend surplus funds available April 1, 1935, and for an extension of the budget from April 1 to June 16, 1935. The proposed basis of

contributions is one-twentieth of 1 per cent of shipments.

Aluminum: The NIRB has suspended the trade practice provisions of the code for the aluminum industry, effective March 25. The suspended portion of the code, Article IX, provides, in part, that "no member of the aluminum industry who produces aluminum ingot from virgin aluminum alone or from virgin aluminum in combination with scrap which has not left his possession shall discriminate under like conditions in the prices charged for such ingot (whether charged to himself in case of fabrication prior to sale, or charged to others in case of sale for fabrication)

either between himself and controlled companies on the one hand and other purchasers on the other hand; or between such other purchasers."

Chromium: The NIRB has announced that the United States Chromium Co., Pittsburgh, has applied for exemption from the minimum wage provisions of the fabricated metal products manufacturing and metal finishing and metal coating industry code and for permission to pay apprentices received from educational institutions at the rate of 20c. an hr.

Lightning Rod: The code authority for the lightning rod manufacturing industry has applied for NRA approval of a \$750 budget, and the basis of contribution for the period from Jan. 1, 1935, to June 16, 1935.

Valve and Fittings: A public hearing will be held April 15, in the Willard Hotel, on amendments to the valve and fittings manufacturing industry code, submitted by its code authority, which would reinstate the terms of payment which existed prior to the approval of the code. The amendments would simplify the terms and extend the due date of payment in certain instances.

Fabricated Metals: The code authority for the fabricated metal products manufacturing and metal finishing and metal coating industry seeks approval of an additional assessment of 1/10 of 1 per cent of gross sales made by each member of the industry for the period from Feb. 15, 1935, to May 15, 1935, to be collected in monthly installments based on previous month's sales. The additional assessment is requested because the number of employees in the industry, on which the original budget of \$160,000 and 50c. per employee assessment were made, was overestimated by approximately 140,000.

Code Authorities Approved

The NIRB has approved the following code authority members:

Gas Cook Industry: E. W. Roberts, Roberts Brass Mfg. Co., Detroit; O. J. Leins, Milwaukee Gas Specialty Co., Milwaukee; R. L. O'Brien, Detroit Brass & Malleable Works, Detroit; and D. M. Hamilton, Brabant Brass Mfg. Co., Detroit; conditional approval given these members.

Metal Tank Industry: W. I. Jones, Farrell Mfg. Co., Joliet, Ill.; A. N. Crawford, John Wood Mfg. Co., Conshohocken, Pa.; C. C. Crouch, Butler Mfg. Co., Kansas City; I. B. Merriam, Chattanooga Boiler Works, Chattanooga, Tenn.; J. P. Keene, Alliance Tank Co., Alliance, Ohio; J. R. Travis, Eaton Metal Products Co., Denver, Colo.; and E. E. Boardman, Boardman Co., Oklahoma City, Okla.

Plumbing Fixtures Industry: Walter J. Kohler, Kohler Co., Kohler, Wis.; W. G. Langford, Richmond Radiator Co., New York; Arthur J. Burgner, Resolute Pottery, Trenton, N. J.; and George E. Hoffman, Crane Co., Chicago.

Chilled Car Wheel Industry: D. H. Sherwood, Maryland Car Wheel Co., Baltimore; W. F. Cutler, Southern Wheel Co., New York; E. P. Waud, Cleveland Production Co., Cleveland; J. A. Kilpatrick, Albany Car Wheel Co., Albany, N. Y.; and J. M. Keller, American Car & Foundry Co., New York.